\$2.00 A COPY; \$44/YEAR

VOL. XVIII. NO. 33



In Depth Risking all for the company ID/13

in Depth How to avoid analysis paralysis Follows 80

Space data Satellite service to target private-line users /75

Next Week
Spotlight on computer-aided software engineering

CW's annual Hardware Roundup begins

CW MI48106UIVYMUIVYM FCWB UNIVERSITY MICROFILMS SERIAL PUBLICATIONS 3300 N ZEEB RD 48106

NSF predicts 1987 shortage of analysts, programmers

By Mitch Betts CW Washington Bureau

WASHINGTON, D.C. - The nation could be faced with a shortage of systems analysts and programmers, amounting to 115,000 to 140,000 workers in 1987, according to a National Science Foundation report featuring projections based on econometric models.

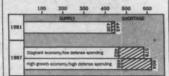
The report, which was released recently, said projections for 1987 indicated it would take a 25% to 30% increase in the supply of these computer specialists to meet the demand, depending on the pace of the economy and defense spending. (A la-bor shortage exists when the projected demand exceeds the supply of newly graduated people in a field by at least 5%, the report said.)

The foundation published projections on labor supply and demand for a variety scientific and technical fields. The study's overall conclusion was that strong growth in demand will create problems

concerning three groups of professionals: computer specialists, who have been in short supply over the past decade, and aeronautical and electrical engineers, who will be in demand because of increases in defense spending.

By 1987, the foundation report said, the majority of science employees will be concentrated in three occupations: computer systems analysis, psychology and

See JOBS page 4



Beating telecom tariffs: The rules have changed, but the game goes on

By John Dix CW Staff

The incentive to use rusty switches is gone, squeezed out like many of the other tricks of the telecommunications manager's trade. But in the new environment, us ers can still pull a few cards out of their sleeves to minimize network expenses

"Rusty switch" is a figurative term for a scheme once used to take advantage of the disparity between intra- and interstate private-line rates. Companies that operated networks within a state, for example, could drop a line across a neighboring border and claim they had an interstate network. The lower interstate rates could then be adopted for the whole network and could result in savings as high as 30%

The use of rusty switches an example of just one network optimization tech - has fallen by the wayside, initially a victim of rising interstate private-line rates and then of the AT&T divestiture.

Before the breakup, AT&T turned a blind eye to rusty switches, "because it all went into the same revenue pool," according to Alan Pearce, president of Information Age Economics, a Washington, D.C.-based consulting company. Now the boundaries are drawn, and AT&T and the divested Bell operating companies jealously guard their revenues

But splitting up AT&T did more than put the finishing nails in the coffin of rusty switches. It fundamentally changed

See TARIFFS page 4

TOP OF THE NEWS

A General Accounting Office report blasted the Social Security Administration's handling of a \$115 million communications contract with Paradyne Corp. Page 2.

Symphony left him a bit flat. A beta test user of Lotus Development Corp.'s integrated software said the package doesn't integrate data easily. Also, analysts compared Symphony with Framework, Ashton-Tate's integrated product.

The bulls ran wild on Wall Street in recent weeks, testing the limits of the computer resources of the New York Stock Exchange and illustrating the critical need for capacity planning. Page 8.



Washington perspec-tive. Dr. Ruth M. Davis amassed a slew of credentials and awards in a long and impressive career in government DP-related work. She reflected on her experiences and on the evolutionary changes in comduring puting

Computerworld interview. Page 17.

Topping its line of 16-bit minicomputers, MDS Qantel, Inc. unveiled its System 264. The firm said the machine offers twice the internal throughput of Qantel's older model, the System 64. Page 81.

MANAGER PROFILE

For retail exec. DP led to success

"The modern age has a false sense of curity because of the great mass of data at its disposal. But the valid criterion of distinction is rather the extent to which man knows how to form and master the material at his command.

- Johann Wolfgang Von Goethe, 1832.

LOS ANGELES -- This framed quotation, penned by a calligrapher, hangs on the wall behind James E. Gray's desk Just beneath it sits a computer terminal, blinking out the "Daily Flash Sales Report" in bright green letters. Gray, 45, is the executive vice-president of Bullock's, whose corporate headquarters sits squarely on a corner of downtown Los Angeles in a mirrored building.

It could be a motto of sorts for Gray,

whose career path has taken him from the computer room to the executive suite of this California-based department store chain. Gray said he appreciates the timelessness of the German dramatist's words, set down more than 150 years

Gray has found that his ability to form and master data, gleaned from his days in the data processing department, has served him well in his new role as executive vice-president.

'I know there are systems solutions to many problems, and I know that I can change things," he said. "Other executives think they have to live with problems or beat up a person to solve it.
Someone with DP experience asks: 'Is there a systems solution?"

Gray posed that question a few years ago about Bullock's method of handling purchase orders, when he realized that the firm was buried in accounts payable paperwork. So he wrote an on-line purchase order management system. botched it up terribly," he confided with a self-effacing laugh, "but it was the right thing to do." Eventually, the system's wrinkles were smoothed out, he added.

More than 20 years ago, when Gray was contemplating his career choices, he did not even consider data processing. When he graduated from the University of Texas with a degree in general busi-ness, he had his sights set on a job as a - a buyer for a department store chain.

After a brief stint with a Texas clothing store, he moved to Los Angeles and began work in the cosmetics department of Bullock's

In 1962, Bullock's decided to establish an internal data processing center and tapped Gray and four other employees

"At the time, I didn't know what data processing was," Gray remembered with a laugh. The five were sent for training to NCR Corp., which was providing Bull-See GRAY page 7

NEWSPAPER

Trilogy Systems discontinues chip-making

CUPERTINO, Calif. — Trilogy Systems Corp., which in June [CW, June 18] announced it had cancelled attempts to develop a large-scale IBM-compatible computer, said last week it was suspending development of the wafer-scale integration semiconductors around which the computers were to be designed.

The company said it will instead extend its high-performance circuit, packaging and interconnect technologies to accommodate conventional semiconductors.

As a result, the company discontinued its semiconductor manufacturing operations here and cut its 460 person work force by half, a spokesman said.

The company said it would seek a tenant to occupy the facility and was in the process of finalizing plans for an undisclosed firm to use its production facility in Ireland.

Co-founder and chairman Gene Amdahl said, "Our decision to close the manufacturing facility and to modify our technology program reflects the necessity to conserve our resources to maximize the likelihood of successful commercialization of the circuit development, packaging and interconnect aspects of Trilogy's technology,"

The latest announcements also would seem to doom Amdahl's recently stated goals to develop a small processor based on wafer-scale technology (see page 112)

nology (see page 112).

However, Amdahl said last week, the company still was studying a number of applications of its circuit development technology, including its use in medium- and high-performance computer systems "with a goal of finalizing our development plans by the end of next month."

He also said the company is continuing discussions with sharehold licensees of the technology regarding possible modifications of existing arrangements. Digital Equipment Corp., Sperry Corp. and Cli-Honeywell Bull invested a total of about \$80 million in the company.

Based on Amdahl's reputation as a key member of the IBM 370 architecture design team, and his early success in founding Amdahl Corp. as an IBM plug-compatible manufacturer, Amdahl had been able to raise more than \$230 million from a variety of sources.

CORRECTIONS

Digital Equipment Corp. has begun commercial shipments of its new Micro PDP-11/73 system now, rather than in September as was mistakenly reported [CW, July 23].

The photos accompanying "RTI founder sees relational DBMS gaining user approval" and "Oracle president enjoying relational DBMS' popularity" [CW, Aug. 6] were inadvertently reversed.

First-quarter revenues of BGS Systems, Inc. were incorrectly reported in the Nickels & Dimes column of the July 30 edition. Revenues for the quarter were \$2.2 million, up \$701,658 from the previous year.

Trilogy Systems | GAO slams Paradyne's SSA system work

By Bryan Wilkins CW Washington Bureau

WASHINGTON, D.C. — A General Accounting Office (GAO) report blasted a \$115 million communications modernization contract awarded by the Social Security Administration (SSA), claiming the system has "serious flaws" and charging SSA officials with poor management.

The GAO recommended the entire modernization program be reviewed and the contract with Paradyne Corp. be terminated. The contract is the subject of a suit filed against Paradyne by the Securities and Exchange Commission, as well as the subject of numerous other governmental investigations [CW, April 4, 1983].

Since the initial installation of Paradyne's data communications terminals in June 1981, the SSA has negotiated lower performance standards and loosened internal controls over the administration of the contract, GAO charged. The Paradyne contract called for intelligent userprogrammable terminals to be installed in the 1,350 regional SSA offices.

Requirements changed

The report asserted that the performance requirements of the terminals were changed after repeated failures in acceptance tests of the terminals.

In response to the charges, Paradyne's chief executive officer, Robert Wiggins, said his company had been denied a chance to defend itself at the hearing. He labeled the attacks against Paradyne "without foundation or substance" and said his company has "been caught up in a night-

mare, consisting of a variety of attacks, adverse rumor, innuendo and charges." Wiggins asserted that an independent report by the Mitre Corp. shows that Paradyne's system is working well.

However, the GAO report claimed it took two years for Paradyne's equipment to meet contract performance requirements. "As a result of

'The Paradyne equipment provides no appreciable increase in processing capability over the system it replaced.'—The U.S. General Accounting Office

the SSA's procurement activities with Paradyne Corp., the agency acquired a data communications system that, according to SSA analysis, did not begin to meet contractual system availability requirements on a consistent basis until April 1983—more than two years after the contract award," the report maintained.

The report said that because SSA decided not to require the contract's provision for enhancement of the terminals to enable them to perform local programming for upload to a host computer, "the Paradyne equipment provides no appreciable increase in processing capability over the system it replaced."

SSA officials appearing at the recent congressional hearing where the GAO report was presented were lambasted by Rep. Jack Brooks (D-Texas), chairman of the Government Operations Committee. Brooks called a two-year investigation into the contract by the committee a "story that ... paints a picture of a critical computer project which has been undermined by potential fraud, deception and official misconduct."

and official misconduct."

SSA Deputy Commissioner Marshall Mandell acknowledged the weakness of internal controls existing over the administration of the Paradyne contract. However, Mandell said that Paradyne was honoring the terms of its contract by having the terminals available 98% of the time for SSA operations.

time for SSA operations.

John Wicklein, SSA associate commissioner for system operations, testified that despite initial subpar performance by Paradyne and continuing operational problems with the terminals, SSA employees are happy with the system's performance.

SSA officials acknowledged that equipment downtimes are not counted if Paradyne services and restores operation within a seven-hour period. However, SSA is seeking a credit of \$150,000 from Paradyne because the malfunctions violate the contract.

The terminals supplied to SSA are Paradyne's P-8400 system, based on a Zilog, Inc. 8000 processor and a modification of Microsoft Corp.'s Xenix operating system.

Other components of the integrated system are Mannesmann Tally Corp. printers, C. Itoh Electronics, Inc./Toshiba America, Inc. floppy disk drives and a processor/controller manufactured by Paradyne.

NEWS SUMMARY

U.S. financial institutions will soon be using electronic, rather than paper, interbank payment transfers/5

Lotus Development Corp.'s Symphony received a lukewarm endorsement from a beta site user/6

The New York Stock Exchange's record trading day went almost without incident, thanks to capacity planning that anticipated trading volumes/8

CW at AAAI-84: A variety of product announcements indicated the increasing market orientation of artificial intelligence technology... Al experts are divided on the topic of how Al will fare in the world of traditional DP... Systems vendors see Al as a stage in the evolution of computer technology, but are preparing to meet user demand... Natural language processing systems are beginning to reach their market potential, one speaker said ... Conference visitors had varied views on what constitutes Al/12-16

CW interviews Dr. Ruth M. Davis: Dr. Davis talks about computing, government and her role in each/17

An unpleasant surprise befell an adventurous sports fan who tried to outwit the Los Angeles Olympics' high-tech security system/18 A survey found MIS personnel are most often assigned to supervise company committees charged with recommending micros, developing nets and updating systems/20

Nevada is computerizing its court system and linking it with a central data base to provide judges with up-to-date criminal records/21

Working conditions, not VDTs, are the likely cause of many work-related medical problems, according to a Data Entry Management Association study/24

The jury is still out on the reasons why the computerized jury selection process for one Massachusetts counts summoned a disproportionate number of jurors from one community/26

The first user of a new factory automation software package is using it to monitor production at another firm's plant/28

Employers are turning to a hitherto neglected pool of programming talent the handicapped — as more and more disabled people attempt to enter the work force/32-34

A home health care firm's recently expanded system is handling bookkeeping and work-related employee data/35

A cooperatively owned grocery store chain sought out an integrated package to help with developing and maintaining systems for its client stores/36

Nabisco Brands, Inc. went from paper tape to electronic mail and saved 20% of its messaging operating costs/37

A Buffalo, N.Y., service bureau relies on a utility program generator for everything from report generation to code conversion/38

A national fast-food chain's director of systems development went shopping for software to allow communication between CICS command-level Cobol and DMS/39

International Report/29 Managers on the Move/43 Calendar/44

IN DEPTH

Of time and analysis Follows 80 A risk worth taking?/ID/13 Bottom line/ID/25

EDITORIAL/46
SOFTWARE & SERVICES/55
COMMUNICATIONS/75
SYSTEMS & PERIPHERALS/81
MICROCOMPUTERS/93
COMPUTER INDUSTRY/107

HURB 6

Why are SYBACK & SyncSort CMS the fastest things on no wheels?

(More technology in the tank!)
Call (201) 568-9700.
Arrange a test drive.

You say you've always had very simple tastes? All you ever wanted was the best?

Well, step into our showroom and kick a few tires! We'll show you two programs that are the Ferrari and Lamborghini of VM programs.

- SYBACK the world's fastest and most maneuverable backup, restore and copying program;
- Syncsort CMS the world's fastest and most maneuverable VM/CMS sort program.

What makes 'em so special? Well . . .

(1) TURBO PERFORMANCE: Have you ever stepped down on the gas in a dangerous driving situation and discovered . . . nothing? Well, that'll never happen to you with these two vehicles

Both are equipped with our special brand of "software turbocharging." We call it FBT, which stands for Fluid Buffering Technique. Our competitors call it something else.

We discovered FBT one dark and rainy night when we were trying to find a way to speed up the movement of data in sort programs. After crying "Eureka," we applied it to our OS and DOS sort programs. The results were . . . wow!

Now we've carried that bright idea over into VM dumprestores and sort programs. And the results are still wow! Compared to any other backup or sort program clogging the nation's VM thruways today, SYBACK and SyncSort CMS will save you up to:

- 50% in Elapsed Time;
- 45% in VTime;
- 55% in TTime;
- 75% in SIOs.

So who needs all that speed? You do. If you want to optimize your VM operations, stay out of needless DP traffic jams, and make the boss happy with your throughput.

Here's what happened to one large government agency: Their backup operations used to require a full 24 hours to complete. Then they installed SYBACK. Now their backup takes — are you ready? — one-half hour!

(2) EASY HANDLING: SYBACK and SyncSort CMS are among the most flexible, user-friendly programs ever produced by anybody anywhere. That's one reason programmers love 'em. And where does it say that backup and sort operations have to be hard to be good?

(3) "MISTER SOFTWRENCH" SERVICE: We've got the best pit crew in the business. More than 85% of all customer requests are resolved within 24 hours.

If you'd like to put a little high technology in your VM tank, give us a call. We might even take your used VM dump-restore or sort program as a trade-in!





JOBS from page 1

chemistry. Projected employment for computer systems analysts is expected to increase by 5.6% to 7% a year, a rate almost three times as rapid as those in other major scientific fields, opening an additional 70,000 to 85,000 jobs.

"Although it was not until the 1970 decennial census that this job category [systems analysts] became sufficiently large to become a part of data collection efforts, by 1987 the projection scenarios estimate that 290,000 to 305,000 people will be required to perform this job function," the report

Altogether, roughly half of the systems analysts will be employed in business services (25%); finance, insurance and real estate (12%); and the wholesale and retail trade industries (12%). However, the growth of this labor market will be spread throughout many industries, the report said, due to the decreasing costs, reductions in size and expanding applications of computers for busi-

In the labor category of technicians, computer programming is projected to be one of the fastest growing occupations, representing more than onesixth of the technical work force by 1987, the report said. In that year alone, the foundation's projections indicated, a total of 290,000 to 300,000

programmers will be needed.

The growth in demand for computer programmers is projected to range from 4.3% to 59 year, opening up an additional 55,000 to 65,000 jobs. Nearly half of this growth will be generated by business and service industries, particularly research laboratories and computer service hureaus the rest of the additional programmers will be needed in the manufacturing sector, the report

Combining the projected requirements for systems analysts and programmers in 1987, the report estimated that 578,000 to 604,000 computer specialists will be needed then. However, supply proections showed that only 462,000 to 466,000 qualified computer specialists will be forthcoming from schools and from immigration.

Due to this projected shortage, a massive infusion of workers from other occupations may be needed to fill the gap, the report said. However, it warned that complex computer applications increasingly require people with strong science educations and graduate degrees and said, "Continued high transfer rates from other occupations may be difficult to sustain.

Projections in the report were derived from Data Resources, Inc. economic simulation models and a science and engineering labor supply model sponsored by the foundation. The report, "Projected Response of the Science, Engineering and Technical Labor Market to Defense and Nondefense Needs" (NSF 84-304), is available at no charge from the National Science Foundation, 1800 G St. N.W., Washington, D.C. 20550.

TARIFFS from page 1

the rules of the game

The new rules are sufficiently complicated that, when combined with other divestiture side effects like order backlogs, users have become strapped with their day-to-day jobs and cannot get around to costcutting tricks, or what one consul-tant called the "shorter strokes."
"You're doing [well] if you can just

figure out how to get service today, exclaimed Joseph T. Massey, president of JTM Associates, Inc., a consulting firm based in Atlanta.

While some new networking tricks have been developed, there is always the danger in this transitory period, where some tariffs remain up in the air, that by the time anything is implemented, rates will have changed. The basic difficulty is that the people in Washington are changing the rules at the drop of a hat, with no rhyme or reason," noted Lee Goeller, rhyme or reason," noted Lee Goeller, president of Communication Resources, a consulting company in Haddonfield, N.J. "There are various things you can do in any given time and place, but almost invariably, holes are being plugged as rapidly as possible," Goeller said.

As it stands now, the new game in town, according to Charles G. Abbott, president of a telecommunications consulting company of the same name in New York, is "focusing on the differences between intra- and inter-Lata [Local Access and Trans-

port Areal tariffs."

Latas are the boundaries created after divestiture to define the jurisdictions of the various telephone operating companies. Basically, the local telephone operating companies carry traffic within their Latas, and AT&T and the other long-distance carriers offer services between Latas. Some states have many Latas, while other less populated states may only have one. The 22 divested Bell operating companies have been divided into more than 160 Latas

The creation of Latas, and the establishment of different rates for circuits within and between Latas, has yielded the 1980s' equivalent of the rusty switch, according to Dixon Doll, president of the DMW Group, Inc., a consulting firm based in Ann Arbor, Mich. In many instances, inter-Lata rates are more expensive than intra-Lata rates.

Given this, when optimizing net-works for cost, the idea is to keep circuits from running over into adjoin-Latas to keep "Lata-pure," in the words of Edward T. Garner, executive vice-president of the Aries Group, a network design firm in Rockville, Md.

A circuit that crosses a Lata boundary is said to be contaminated. One thing users can do, Doll said, is 'run circuits within Latas to a concentrator or a hub and then only pay the inter-Lata pricing for connections between the hubs."

Given the size and complexity of many networks, implementing this simple recommendation could be a ferocious task. As Lee L. Selwyn, president of Economics and Technology,

Inc., a telecommunications publishing and consulting firm in Boston, said: "The single biggest problem, given the multitude of tariffs under which a circuit may exist — depending on where it's going and how many operating companies are involved and whether it's contaminated - is being able to put this all together in one place so you can at least look at it.

Donald Dittberner, president of Dittberner Associates, Inc., in Bethesda, Md., concurred. "Frankly, tariffs vary so much from state to state, from specific situation to specific situation, that I'm not sure you identify those [cost-cutting

Offering the same caveat, Doll said that his group has discovered a lot of quirks in some of the proposed tariffs that make it advisable to find ways to get inter-Lata tariffs as intra-Lata services whenever possible.

One of the ways some large users are hoping to skirt the whole issue is by trying to convince long-distance carriers to make their premises a point of presence with their Lata, Doll said. All long-distance carriers maintain these so-called points of presence, or points of interface, in various Latas. AT&T operates the most. By housing a point of presence, a user cuts the local telephone company out as a middleman.

Selwyn summed it up by saying, "It's not as easy as it used to be, and people are going to have to get used to living in a more complex world. That isn't to say they're going to have more choices; it's just going to be more complex."

A Workable Disaster Plan Is No Longer A Nightmare

Are you prepared for the worst? Until recently, the development, implementation and testing of a workable DP disaster plan could have been a nightmare. That was before Disaster Plan/80. Presently in use at over 700 data centers throughout the United rresently in use at over 700 data centers inrougation the Onited States, EDP Security's Disaster Plan/80 is the industry's most comprehensive and proven Automated Model Plan. If you're an MIS manager or DP professional considering implementing a disaster recovery plan, take the first step. This is one presentation you can't afford to miss

If you're interested in ensuring that your firm will survive the destruction of your data center, attend the EDP Security presentation nearest you. EDP Security, Inc. 181 West Street Waltham, MA 02154

617-890-6666



SEPTEMBER NOVEMBER n D.C

OCTOBER

DECEMBER

See us in New York at Info 84 Oct. 1-4, Booth 4542

Second-class postage paid at Framingham, Mass., and additional mailing offices.

Computerworld (ISSN-0010-4841) is published weekly, except: January (6 issues), February (6 issues), March (5 issues), April (7 issues), May (5 issues), June (7 issues), July (6 issues), August (6 issues), September (7 issues), October (7 issues), November (6 issues), December (5 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/Inc., 375 Cochituate Road, Box 880, Framingham, Mass. 0.1730. Mass. 01701.

Copyright 1984 by CW Communications/Inc. All rights reserved.

Computerworld can be purchased on 35 mm microform through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed:

inductal entry Dept., 300 Zeeo Road, Ann Arbor, Mich. 48106. Computerworld is indexed: write to Circulation Dept. for subscription information. PHOTOCOPY RIGHTS: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications/inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.

Permission to photocopy does not extend to contributed articles followed by this extended.

symbol. \$
Special requests should be addressed to Nancy M. Shannon, CW Communications/Inc.,
375 Cochituate Road, Box 880, Framingham, Mass. 01701. ISSN 0010-4841/84 \$3.00 +
\$.50. \$2.00 a copy: U.S. — \$44 a year; Canada, Central & So. America — \$110 a year;
Europe — \$165 a year; all other countries — \$245 a year (alimali service). Four weeks notice
is required for change of address. Allow six weeks for new subscription service to begin.









POSTMASTER: Send Form 3579 (Change of Address) to Computer ochituate Road, Box 880, Framingham, Mass. 01701.

Private-sector clearinghouse set to compete with Fed

WASHINGTON, D.C. — The 30 regional automated clearinghouses (ACH) performing interbank payment functions across the country are gearing up to link into a private-sector electronic payments system. This system is intended to provide cradle-to-grave electronic handling of deposits at competitive market prices.

The regional ACH's sole dependence on the Federal Reserve System for the interbank payments system has been, in recent years, the subject of a spirited contest between the American Bankers Association (ABA) and the Federal Reserve, the country's central banker.

The Fed has argued for an oversight role in monitoring the movement of money, while the ABA, led by its affiliate, the National Automated Clearing House Association (Nacha), has argued the need for competitive pricing of automated services as an option for banks.

Congress passed the Monetary Control Act in 1980, ordering the Fed to permit competition in the handling of electronic funds transfers (EFT) between banks.

Four years later, the private-sector alternative is at hand for banks. Nacha has selected General Electric Information Services Co. (Geisco) to provide the electronic payments settlement for hanks.

Geisco and the regional ACHs are currently finalizing the development of an EFT system that uses Geisco's and the Fed's networks in a cooperative venture. According to Gary Singer, secretary-treasurer of Nacha, the primary issue still to be resolved by Geisco and the regional ACHs is the settlement function, or how the Fed makes a payment to a bank and debits another bank's account.

Joseph Loughry, Geisco's manager of financial services, said the regional ACHs have decided definitely that they want the Federal Reserve to continue its role of making the settlement payments to the banks.

Whether Geisco's network directly feeds a bank's net position as a receiver or payer to one of 11 Fed banks, which then orders the settlement transmitted to the other 10 Fed banks, or whether Geisco is directly feeding the net bank position to each of the 11 Fed banks, is still under discussion.

"We have already developed the applications software, particularly dealing with the settlement function," reported Loughry, who revealed that the proprietary software was originally written for the California-based Cal-Western ACH, for which Geisco is now performing EFT services. Loughry said that the Cal-Western software was transportable to the nationwide system.

Robert Brubaker, immediate pastpresident of Nacha and senior vicepresident at Pittsburgh's Equibank, said the availability of settlement software was the primary reason Geisco was selected over other computer services companies that sought the Nacha job. McDonnell Douglas Automation Co. was the other finalist in consideration for Nacha's private-sector system, Brubaker said.

"Really, the issue is now at the local ACH level, where a decision will have to be made whether to link into the private-sector system as well as

into the Fed's," Brubaker said, who added that the ultimate EFT system used by the banks will be a "dual system".

Brubaker said the Fed has quickly moved to upgrade the technology of its own EFT system with a new plan — ACH '84 — that mirrors the allelectronic payment system being offered by Geisco.

He said that the Fed plans to have

the ACH '84 system operational by the first quarter of 1985, the same time that the ACHs and banks will be deciding whether to link with Geisco.

"We are very interested in the private-sector processing of interbank payments because [the Fed's] prices have been rising. One of the things that has also been happening and probably will continue is the merger of ACHs." Brubaker added.

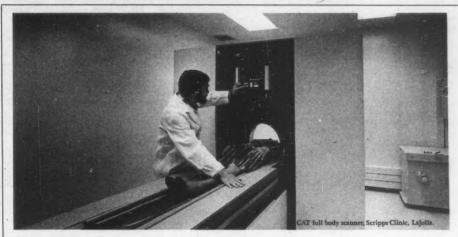
"We now will have options with the private-sector system, which should make EFT more efficient," he

Among the features that a "pure electronic" payments system will offer banks are 24-hour operations, timeliness and availability over the current system, unlimited capacity, continuous-flow processing, data confidentiality and security, management reporting and statistical analysis, transaction warehousing, automated returns processing and on-line client inquiry capabilities.

The Nacha push to make a private-

sector EFT system available to banks is prompted by the rising costs of processing checks for banks. Brubaker said that settlement costs a bank between 80 cents and \$1.50 per paper check vs. pennies for an electronic transaction. "Unfortunately we have oversold the public on the use of paper checks, and we hope to change that," Brubaker said.

Geisco facilities are located in Rockville, Md., and the Nacha private-sector processing system would be added onto Geisco CPUs now used for remote computer services, in particular, three IBM 3081s operating in a shared direct-access storage device environment with the MVS/XA operating system.



How Scripps Clinic cured PC to mainframe ills with DataLynx/3274.

The Scripps Clinic and Research Foundation expanded its data communications systems with inexpensive DataLynx 3274 protocol converters from Local Data.

Scripps uses the DataLynx/3274 to enable a variety of personal computers and ASCII terminals to access data stored in their IBM mainframe. The DataLynx/3274 allows these devices to "look like" an IBM 3278. The DataLynx can support over 100 ASCII ASYNC display terminal types.

The DataLynx/3274 gives Scripps the freedom to locate their ter-

minals wherever they're needed—and save money by selecting <u>any</u> inexpensive terminal they choose.

DataLynx/3274 includes interleaved CRT and printer support over one ASYNC line. Scripps uses a low-cost ASCII label printer in emulation of an IBM 3287 to print their pharmacy labels.

DataLynx offers more advanced features than any other protocol converter including dual host support, hard copy KSR capability and dual level password security.

DataLynx SNA is PU type 2 and BSC includes EBCDIC and ASCII support. There's psuedotransparent mode and a powerful, friendly menu-driven config-

urator mode that makes DataLynx easy to use.

Cure your pc to mainframe problems. Call or write today for more information. Ask about our 30-day free trial program.





2701 Toledo Street • Suite 706 • Torrance • California • 90503 Telephone (213) 320-7126 • TLX 182518 • In Canada call (613) 737-5941

Symphony gets mixed reviews from beta test site

By Paul Korzeniowski CW Staff

BLOOMFIELD, Conn. — A beta test user of Lotus Development Corp.'s Symphony integrated software package has given the product a lukewarm endorsement.

While Symphony boasts word processing and communications functions absent in Lotus 1-2-3, it is difficult to master, does not easily integrate data and lacks the versatility of stand-alone packages, according to Rich Reed, manager of personal computer administration at Cigna Corp., an insurer here.

"Users have to realize that there are compromises with integrated packages," said Reed, who has worked with a beta copy of Symphony since April. "They often sacrifice functionality and ease of use for integration."

While Cigna has about 600 1-2-3 users, Reed is unsure of how many users will eventually upgrade to Symphony. "We will determine upgrades on a case-by-case basis," Reed said. "For some users, Symphony makes sense; for others, it doesn't."

The upgrade involves more than exchanging 1-2-3 for Symphony, Reed noted. Cigna's IBM Personal Computers, equipped with 384K bytes of random-access memory (RAM) and a hard disk, will have to be expanded to 512K bytes of RAM.

"I tested Symphony with an IBM Personal Computer with [384K bytes of RAM]," said Mark Bernacki, lead senior analyst at Cigna. "When I loaded a 200-row by 30-col. spreadsheet, the program ran out of memory after loading the first 30 rows. In

[512K bytes of RAM], the spreadsheet worked smoothly. I like Symphony's spreadsheet. It's faster and has better windowing capabilities than 1-2-2."

Another upgrade consideration is ease of use. "Some users may not need the power and functionality that Symphony offers and may find it is easier to work with a less complicated program such as 1-2-3," Reed noted.

Experienced 1-2-3 users may not intuitively understand how to manipulate Symphony. "Some Symphony commands are different from those in 1-2-3," Reed explained. "One has to track what environment one is in, for example, spreadsheet or word processing, and where in that environment they are to enter appropriate commands."

Major consideration

So training "is a major consideration for determining how many users will upgrade to Symphony," Bernacki reported. "We estimated that 30 hours of training are needed to learn Symphony."

The command sequence differences may also render 1-2-3 macros, which are single commands that execute multiple keystrokes, inoperable. "We are examining our macros to determine which have to be changed and which can still be used," Bernacki noted.

Despite the fact that 1-2-3 and Symphony are closely related products, data cannot be transferred easily between the two programs. "Data from 1-2-3 can be loaded into Symphony, but not vice versa," Reed said. "This may cause a problem

for workers who share data with their managers. Also, since Symphony and 1-2-3 use different file suffixes, 1-2-3 files are not listed when a user reads a disk for 3ymphony files."

Other limitations emerge when one attempts to transfer data among Symphony's five applications. "It is easy to transfer data written in tabular form," Reed said. "But there are problems transferring data to and from the word processing application. Many operations resemble simple cutand-paste routines."

Yet, word processing represents the key difference between 1-2-3 and Symphony. "Many potential users may buy Symphony rather than 1-2-3 and a word processing package such as [Micropro International Corp.'s] Wordstar or [Multimate Software Systems, Inc.'s] Multimate," Bernacki said.

Symphony's word processing facilities are not

Symphony's word processing facilities are not as good as these packages' features, according to Reed. "Symphony's word processing capabilities are a bit weak," he said. Shortcomings cited were the absence of page breaks, the requirement of manual indentation and the word processing application's unique commands. "It will take a user a great deal of time to become familiar with the word processing application," Reed said.

Poor documentation presented a significant

Poor documentation presented a significant challenge to Reed's evaluation. "I was working with galley proofs that were very crude," Reed said. "I may have been more comfortable with the product if I had better documentation. It took me two-and-a-half weeks to become comfortable with Symphony."

Framework, Symphony even in integrated software ratings

By Paul Korzeniowski CW Staff

Which is the better integrated micro software package, Lotus Develoment Corp.'s Symphony or Ashton-Tate's Framework?

Neither, according to a sampling of industry observers and corporate software users recently interviewed, who said both products contain features that will satisfy some users and flaws that may an-

Symphony, they felt, seems destined to assure Lotus of its place as the leading software supplier to the number-crunching community. "Lotus has gambled that integrated products are destined for power users," said Richard Strauss, vice-president of products at Corporate Software, Inc., a Waltham, Mass., microcomputer software distributor.

"Manipulating data with Symphony is like walking through a deep cavern," Eric E. Vogt, president of Micro Mentor, Inc., remarked. "After making a few turns, one never knows where one will surface."

While many industry watchers have criticized Symphony's complexity, one observer said the criticism was unwarranted. "Corporations have to be willing to spend time to train potential users," noted David Ferris, president of Ferrin Corp., a San Francisco personal computer services company. "The benefits always outweigh the brief training investment."

While some users praised Symphony's spreadsheet capabilities, they criticized its word processor. "Symphony is basically a spread-

sheet with a word processor wedged into it," Corporate Software's Strauss said.

Ferris noted that Symphony's word processor resembles Micropro International Corp.'s Wordstar of three years ago. "It's crude and lacks a number of full-function word processing features," Ferris

remarked.

Despite Symphony's billing as a fully integrated offering, its integration is limited. "Symphony is designed as one spreadsheet file that contains all data files," said Morton Rosenthal, chairman of Corporate Software. "Merging and manipulating files is difficult."

To merge files, users have to identify where in the spreadsheet the files reside, determine how much space they require and make sure that the desired destination has sufficient space to store the files.

In certain cases, integration among Symphony's applications is also limited, Strauss said. "There are constraints for sharing data among spreadsheet, graphics and word processing applications," he remarked.

Framework and Symphony were each scheduled for shipment July 2. Lotus met its commitment; Ashton-Tate's decision to add communications software to Framework delayed its shipment date and raised certain questions. "Our customers' concerns about Framework are primarily whether the product is complete and bug-free rather than how well it works. Some question whether Framework's other applications are sufficiently sophisticated for power users," Rosenthal stated.

Multiapplication packages: Who needs them?

By Paul Korzeniowski

Who needs a five- or six-application, integrated micro software program?

Vendors, led by Lotus Development Corp. and Ashton-Tate, are attempting to convince users that everyone needs these packages. Yet users have not been fully persuaded, according to recent interviews.

Neil Cookrish, product manager in the information management services department at Bankers Trust New York Corp., said, "I question whether any user legitimately requires five or six applications."

Richard Strauss, vice-president of products at Corporate Software, Inc., a Waltham, Mass., corporate microcomputer software distributor, added, "Integrated packages are examples of overkill — they limit functionality by trying to cater to everyone. They resemble the pocket calculator in the early 1970s. It started out with simple functions like adding and subtracting. Then, companies added functions like sine, cosine and square root, which most people never used."

Many users do not even require all the features of stand-alone packages. "Most people only use 20% to 30% of the functions of most packages," according to Dan Spinner, vice-president of marketing at Management Information Software Co., a corporate microcomputer software distributor based in New York

According to Strauss, integrated products offer more applications at the cost of less functionality than stand-alone programs. "Integrated

products offer a permeation of compromises; users do not receive the market's best data base manager, word processor or spreadsheet," Strauss claimed.

The reason for the compromises is that current hardware is unable to drive multiapplication packages. "Products like [Ashton-Tate's] Framework and [Lotus'] Symphony strain the capabilities of the IBM Personal Computer," Strauss added. "These packages require micros with more powerful processors."

Hardware limitations force vendors to offer only levels of integration. "Some vendors' claims are at best optimistic; at worst, they are severely misleading," stated David Ferris, president of Ferrin Corp., a San Francisco personal computer services company. He noted that some integrated programs offer no more than cut-and-paste techniques for sharing data.

One manager is looking to a different method to share data. "We want to provide our users with the opportunity to take 1-2-3 and plug in a statistical analysis package," Cookrish said. "We would like to see an operating shell that allows plug-in software and is user-friendly. We have just begun designing that type of package."

Cookrish described a product like Quarterdeck Software Co.'s Desq and Microsoft Corp.'s proposed Windows, but did not think that either matched his company's needs.

Cookrish's search for an operating system shell is atypical. "Since Framework and Symphony were announced, we have seen a decrease in interest in products like Desq," Spinner claimed.

GRAY from page 1

ock's with its first computer system. "I began writing programs," Grasaid, "and I found I loved it." It was the beginning of a new profession in a fascinating world that offered the chance to combine logical thinking

and creativity, Gray said.
"I liked the discipline of programming," Gray explained. "I liked its puzzle dimensions. Someone would say: 'Here's a problem. Now go figure out a solution.' That really intrigued

He began as a programmer and, as he put it, "worked [his] way through. the department, one job at a time," until the late 1960s, when he was named director of the MIS depart-

A few years later, he moved into the position of controller, with the data processing department still under his wing. In the mid-1970s, Gray became vice-president of finance which brought the firm's credit program and legal activities under his care as well. In the summer of 1983, he was appointed executive vicepresident of Bullock's.

According to Gray, data process-ing experience is a terrific asset for an executive in the retail industry be-cause it provides a "qualitative understanding of the business" through its broad exposure to the various levels of the company and through the in-depth view it offers.

"If you work as a systems analyst or programmer in the accounts payable department, you really learn accounts payable; you really learn the nature of the application," he explained

Yet, Gray acknowledged, it is rare to find an individual in the data processing department who is as adept at managing people as he is at managing bits and bytes. For those who have the calling, Bullock's provides guidance and support in the form of a management development training class held twice a year. In 14 sessions, Gray and other senior managers teach their pupils how to become better managers.

When asked to name the qualities necessary to move from the data processing department into a managerial post, Gray was quick to answer.

"There are six qualities that are important," he said. "A lot of people might be good in four categories but deficient in two, which will be a real handicap to their success," he

AWC elects president

WASHINGTON, D.C. — The Association for Women in Computing has elected Virginia C. Walker, a data base manager for the Energy Infor-mation Administration in Washington, D.C., as its president for the 1984-85 year.

Walker has been a member of the association's national board of direc tors since its inception in 1978 and recently completed a two-year stint as its program vice-president.

At its annual conference in July, the association also awarded its Augusta Ada Lovelace award for professional excellence to Dr. Ruth M. Da-vis, president of the Pymatuning Group, Inc. in Washington; D.C.

warned.

According to Gray, a successful

Is smart

Is a hard worker, which for Gray translates into a willingness to put in long hours on the job.

Has "people empathy" skills.

Is a good communicator, both written and verbal.

■ Is ambitious.

Has a sense of humor.

The company that taught Gray about bits and bytes continues to "home grow" much of its data pro-cessing staff in programmer's training classes that teach DP to specially selected Bullock's employees and col-lege students. After an intense four months, the students graduate to a programmer position. According to Gray, the class produces more than 90% of the firm's staff.

Sentence set in IBM slavings

WASHINGTON, D.C. -- A Marvland county Circuit Court last week sentenced Charles Thomas Mann, a former IBM employee, to 1,080 years plus three consecutive life terms for a 1982 shooting spree at an IBM facility that left three dead and others wounded.

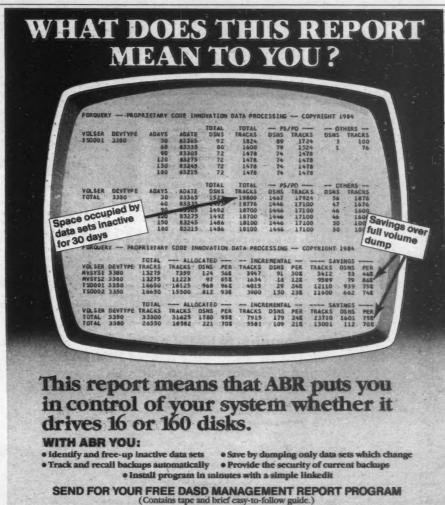
Mann originally sought an insan-ity defense claim, but changed his mind after lengthy psychiatric coun-

Mann said the motivation for the shooting spree was prompted by the fact that he had been laid off from his job at IBM. He also felt that because he was black, he was being denied an opportunity to advance at the company.

Montgomery County Circuit Judge William Miller permitted Mann, at his sentencing, to address the courtroom for an hour, during which Mann dis-cussed the conditions of the penal system and not the shootings.

The statement, like the crimes [Mann] committed, evidences a twist-ed mind," commented Miller, who noted also that Mann had "failed to beg the court for forgiveness.

The three left dead after Mann drove his car into the lobby of the IBM building in Bethesda, Md., and opened fire with a machine gun were The shootings took place May 28, 1982 [CW, June 7, 1982].



The only thing more convincing than seeing your own data produced in report form with such ease and accuracy is the factual measurement data you can provide to those whom you would influence and persuade.

ABR provides an efficient and easy-to-use method of managing the space on direct access volumes, regardless of the size of your system. And this report will help you prove it.

FDR — The Fastest DASD Management System...

So call 201-777-1940 for fast response, or write to:



NYSE system bears up under record stock trading

By John Desmond

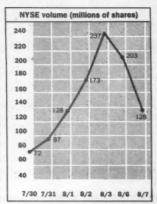
NEW YORK — If the number of shares traded Aug. 3 on the New York Stock Exchange (NYSE) had been traded any day two years ago, the computer center that processes the transactions probably would have been in trouble.

But the timing of the largest single trading day in Big Board history—capping a rally that began July 30 and culminated with 237 million shares exchanged on Aug. 3— was fortunate for the Security Industries Automation Corp. (Siac), which processes the transactions. Siac is nearing completion of a \$10 million, two-year effort—to increase system capacity to accommodate a 250 million-share day, according to John McGee, vice-president of Siac corporate affairs.

Two years ago, system capacity was 150 million shares traded per day, McGee said. However, the work load for Siac is dictated not so much by the number of shares traded as by the number of individual transac tions. Although Aug. 3 set the record for the number of shares traded, more individual transactions occurred last Monday, according to Donald Dueweke, senior vice-president of market operations for the NYSE. Transactions totaled 101,651 on Aug. 3 and 105,976 the next Monday, he said. (The record for transactions/day was set on Oct. 13, 1982, when 107,601 transactions made, according to an NYSE spokes-

Though the number of shares traded on Aug. 3 was prodigious, system capacity was not reached, Dueweke said. Trading volume in messages per second on the Common Message Switch system, the interface between member firms ordering systems and the NYSE, was only 44% of capacity and 51% the following Monday, Dueweke said.

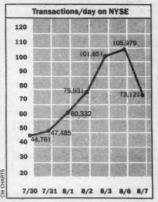
Siac, a subsidiary of the NYSE and



the American Stock Exchange, uses volume forecasts to project required CPU message rates. Siac completed its last system upgrade in the nick of time this year, just as the firm did in the summer of 1982, according to Charles McQuade, Siac president and chief executive officer.

Since trading records were set in the summer of 1982 [CW, Aug. 30, 1982], Siac has added an IBM 3083 mainframe, replaced an IBM 4341 mainframe with a 3031 mainframe and has added 50 Tandem Computers, Inc. transaction-oriented minicomputers to the 70 already in place, McQuade said. A number of Tandem fault-tolerant devices are also employed within the overall configuration. That configuration consists of two IBM 370/158s and a 370/148; two IBM 3033s; one IBM 4341; four Sperry Corp. mainframes: two 1100/82s and two 1100/60s; and nearly 40 Digital Equipment Corp. PDP-11/05, 11/45 and 11/70 minis.

If projections show that the volume is likely to exceed 250,000 transactions in a day, Siac can add more hardware. McGee said the decision was made four years ago to use a



modular CPU architecture capable of expansion or even contraction.

Is there a physical limitation to system capacity based on how fast traders can execute orders?

"There doesn't seem to be," McQuade said, adding that the two recent heavy trading days were test enough for limitations. "Two hundred thirty-five million shares is just mind-boggling," he said. He noted that 72 million shares were traded in the first hour, and total trading exceeded the prior record—set just the previous day — by 65 million shares.

What happens if the system breaking point is reached? "There's no such thing as that," McQuade said.

such thing as that," McQuade said.
For one thing, "more and more big players are out there," McQuade said, referring to the institutional investors that trade huge numbers of shares in one transaction. Block trades of at least 10,000 shares each represented 135 million of the total shares traded Aug. 3, McQuade said. The average number of shares per trade is 1,728 today, vs. half that number about five years ago, according to McGee.

If Siac's market reporting system

was down for more than a 10-minute period, McGee said, "There is a high probability that the market would have to cease trading." For that reason, he said, Siac puts "an extremely high premium on recoverability and availability" of the system.

Siac is involved not only in system support, order processing, trading and reporting, but in clearance and settlement for trades involving stocks, bonds, options and financial futures, McGee said. As a result of the record trading on Aug. 3, Siac was extremely busy immediately thereafter settling trades. "Right now, we're just beginning to be hit by what happened," he said last week. "That's a delayed reaction."

From one trader's point of view, the system reacted well to the record-breaking Aug. 3. "Considering that we had the highest volume in history, the system worked with a remarkable degree of efficiency," said Michael Geran of E. F. Hutton & Co. in New York. While the paper ticker lagged some 18 minutes behind in updating prices, the CRT screens posted prices only a few seconds later than usual, Geran said. He noted that both the ticker and the screens usually post prices at the same time.

Asked whether system capacity should be upgraded again in the wake of the recent trading records, Dueweke said, "Not unless market conditions change and we start looking at a push to the 300- to 350-million shares-per-day range."

Record trading pops red flags

NEW YORK — When recordhigh trading blitzed the New York Stock Exchange on Aug. 2, 3 and the following market day last Monday, red flags were raised in the exchange's Market Surveillance Services department.

Market Surveillance has established price and volume-trading parameters for stocks. When a parameter is exceeded, the stock is flagged and a review ensues. Record days of 237 million shares traded on Aug. 3, 203 million shares on Aug. 6 and 173 million shares on Aug. 2 kept the department very busy.

According to Agnes M. Gautier, a vice-president in Market Surveillance, "On high-volume days, the stocks did kick out because the prices moved up, hit the parameters and were flagged. From that point on, the system was working — probably too well."

Once a stock is flagged, it is reviewed by one of 16 analysts, each of whom specializes in two to three industries.

The analysts check the previous 30 to 40 days of the stock's trading, watching primarily for consistency with the market, Gautier said. Any aberrations are evaluated.

A typically detected error is the result of input errors on the trading floor.

If you're planning to install a computer system or move one, follow the lead of IBM, DEC, Burroughs, Honeywell, Univac, CDC, HP, and the U.S. Bureau of Standards.

Your computer room's electrical environment is crucial to the success of your ADP operation. So if you're an ADP manager, engineer, or site planner, learn "how-to" and "how not to" install computer room wiring at a one-day seminar.

Specific seminar topics include grounding, power isolation and conditioning, life-safety systems, static electricity control, and lightning protection. All seminar material is based on the new "Guidelines on .
Electrical Power for ADP Installations" published by the National Bureau

of Standards, U.S. Department of Commerce

All seminar attendees will receive a copy of this important document, which describes the Federal Government's and computer industry's recommended guidelines for safe, reliable ADP systems operation. The major computer manufacturers previously mentioned, along with many others, have reviewed its contents and approved them.

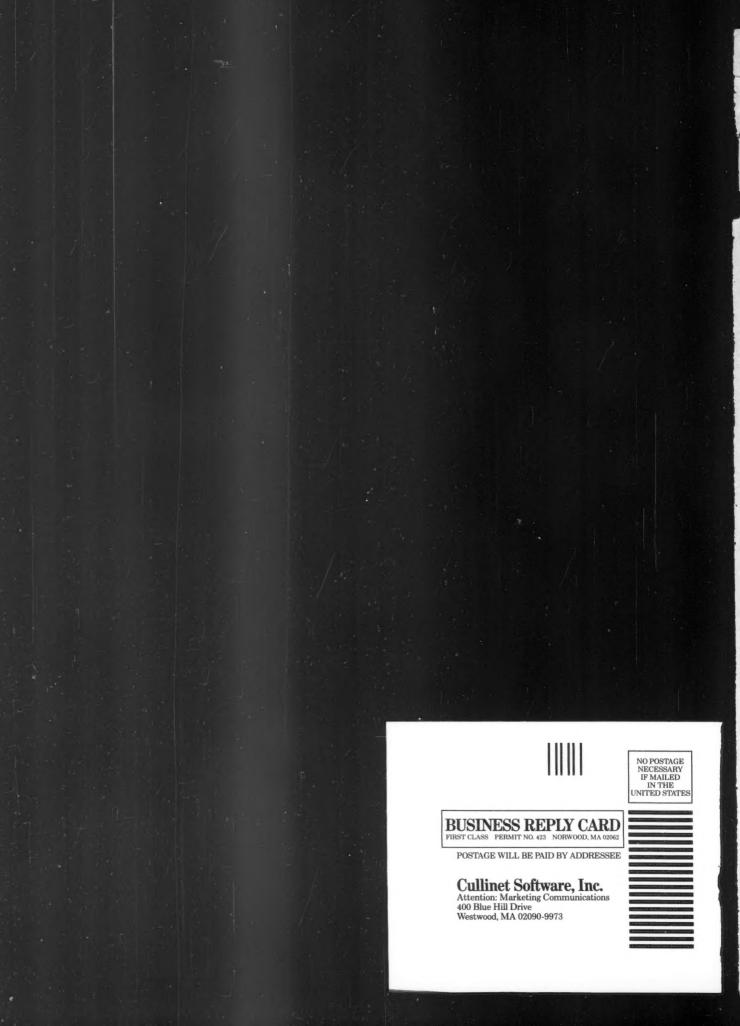
Don't pass up this chance to solve your ADP electrical problems before they occur.

Seminar Schedule		tems Corp./P.O. Box 6240/Ca i-6566; ask for Bob Miller.	arson, CA 90749.	
June 20-Philadelphia	YES, register me for your Al	OP Power Seminar in		(city)
July 18-Chicago	on	*	(date) My check for	\$195.00 per person is enclosed.
August 14-San Francisco	XAME		TITLE	
September 6-New York City	COMPANY		TELEPHONE ()
October 18-Boston	STREET	circ	STATE	ZIP
November 8-Dallas December 6-Atlanta	NO, Don't register memore information on ele requirements for ADP in	ctrical power COM	PUTER POWER	SYSTEMS CORP.

Cullinet: I'd like both.

□ Please send me more information about IDMS/R
□ I'd like to attend a seminar in

| City| On | Cit



For the 4300 user prepared to sacrifice performance for ease of use in a relational dbms, two little words:

You're in a tough position.
You've got management
telling you they want the system
up and running yesterday. And
you've got a small technical staff
that simply doesn't have the time to learn

complex new skills.

So it's no surprise that your inclination is to settle for something less in your choice of databases.

In response, we have just one word of advice: don't. With Cullinet's new relational database, IDMS/R, you can have the best of both worlds – ease of use and performance – from the acknowledged leader in database management software.

IDMS/R is a powerful relational database that greatly reduces the time it takes to develop applications. Its facilities are so simple to use, your end users can develop applications without intervention from your data processing staff. All they have to

do is define a relational record, and IDMS/R does the rest.

IDMS/R is also extremely flexible. It's a system that anticipates change



by providing for the dynamic definition and redefinition of your relational database.

You'll also appreciate the fact that IDMS/R conserves

your finite data processing resources. With a feature called "Relational Fastpath," you can tune the database and thus benefit from a dramatic boost in performance. It's this feature, in particular, that makes IDMS/R a high performance relational dbms.

And while the product itself has so much to recommend it, we'd be remiss if we failed to point out what our more than seven hundred 4300 users already knownamely, that it comes with the level of service and support Cullinet is noted for. Educational training, technical support, even a 24-hour hotline.

To find out more about IDMS/R, the database that combines high

performance and ease of use, contact Cullinet.

The company that doesn't ask you to make sacrifices.

I'd like both.	CW813
Name/Title	1-1-1-1-1-1
Company/Department	
Address	
City/State/Zip	3. 4
Phone	

Database: Cullinet

© 1984 Cullinet Software, Inc., 400 Blue Hill Drive, Westwood, MA 02090-2198
Phone, toll-free, 1-800-225-9930. In MA, 617-329-7700.

AI market orientation evidenced by AAAI-84 entries



CW AT AAAI-84

AUSTIN, Texas — The increasing commercial market orientation of artificial intelligence technology was evidenced by the variety of product introductions at the American Association of Artificial Intelligence National Conference on Artificial Intelligence (AAAI-84) held here last week.

Digital Equipment Corp. took advantage of the conference, jointly sponsored by the AAAI and the University of Texas at Austin, to an-

nounce a series of agreements signed recently with five independent producers of AI software. The agreements call for DEC to market jointly with the companies six AI-oriented packages for DEC's VAX-11 and microcomputer lines.

Among the products is Inference Corp.'s Automated Reasoning Tool, which was designed to help users create expert system applications. The system is written in DEC's recently released VAX Lisp language and runs under the VMS operating system.

Also included is Gold Hill Comput-

Also included is Gold Hill Computers, Inc.'s Golden Common Lisp, which runs on DEC's Rainbow 100 and 100 Plus systems under Microsoft Corp.'s MS-DOS. A subset of Common Lisp, the system is said to be compatible with VAX Lisp and is designed for application development and to provide a training environment for programmers.

The University of Southern California Information Sciences Institute's Interlisp Lisp-based programing environment was also included in DEC's announcement. Interlisp is designed for use in AI research and development and runs under VMS and Unix on VAX-11 systems.

Prolog II from Prologia S.A. of France will also be offered through DEC. The package is said to be an arithmetic implementation of the Prolog language. It runs under VMS and can be used for AI product research and development and application programming.

The remaining products in the DEC announcement were developed by the Carnegie Group, Inc. The Plume package is said to be a tool for constructing natural language interfaces to data bases, expert and simulation systems and other applications. The SRL+ package reportedly is an integrated environment for the development of knowledge-based systems. Both are written in Common Lisp and operate under VMS.

A spokesman for DEC said the

A spokesman for DEC said the packages are currently undergoing DEC's in-house evaluation, and prices are scheduled to be released individually following that process. DEC can be reached at Maynard, Mass. 01754.

Tektroniy sonovacements

Tektronix, Inc. announced the 4404 Artificial Intelligence System, which a spokesman said is designed to support AI research and application system development. The system provides a programming environment that includes a microprocessor, a user interface employing mouse technology and bit-mapped graphics and optional networking capabilities. It includes Xerox Corp.'s Smalltalk-80 programming language, with the Lisp and Prolog languages available as options.

The standard 4404 is a desktop system featuring the Smalltalk-80 programming environment running on a Motorola, Inc. 68010 microprocessor with a hardware accelerator that supports floating-point operations. It includes 1M byte of random-access memory with page-on-demand memory management, which provides an 8M-byte virtual-memory address space that permits complex program development with

out segmentation or overlays.
The 4404 Artificial Intelligence
System is priced at \$14,950 from
Tektronix, P.O. Box 500, Beaverton,
Ore. 97077.

In other hardware announcements, Lisp Machine, Inc. introduced its LMI Lambda 4X4 four-user Lisp computer. The system is said to be a full-function software development workstation that utilizes the firm's Lambda family parallel processing capabilities to allow four fully independent Lisp processors to share power supplies, communications, tames and disk storage facilities.

power supplies, communications, tapes and disk storage facilities.

According to a spokesman, each user on the 4X4 system has access to an LMI Lambda Lisp processor and can utilize an individual keyboard and mouse pointer, a high-resolution display and a display controller.

display and a display controller.

The LMI Lambda 4X4 is priced at \$45,000 per user from Lisp Machine, 6033 W. Century Blvd., Los Angeles, Calif. 90045.

Intellicorp announced Version 2.0 of its Knowledge Engineering Environment (KEE), a software system that reportedly enables users to develop knowledge-based systems.

velop knowledge-based systems.
Version 2.0 is said to offer a logic-based language called Tellandask that combines a data base query language with expert system deductive capabilities.

Version 2.0 of KEE is priced at \$60,000 for the first CPU from Intellicorp, 707 Laurel St., Menlo Park, Calif. 94025.



Ambitious Salesman.

Introducing the WorkForce Development System. A powerful hardware/software combination that lets you take custom turnkey systems to market faster, easier than ever before.

Thanks to WorkForce — a 68000-based, multi-user system that's built for dependability and expandability.

And thanks to a software system with an advanced COBOL program generator and built-in word processing, DBMS and spreadsheet packages. Packages that integrate perfectly with the custom programs you design yourself.

design yourself.
With this combination, you can create consistent code, making custom-designing faster and simpler. You can spend more time developing and less time programming. You can offer the most comprehensive solutions your customers will ever use. And because the code is so consistent, it's easy to maintain.

The WorkForce Development System. Put our

The WorkForce Development System. Put ou application programmer to work for you. And watch it seil

itself, ambitiously,

WorkForce
Good help isn't hard to find.

WorkForce, c/o Digital Datacom, Inc., 27721 South La Paz Road, Laguna Niguel, CA 92677 (714) 831-8470.

Future cloudy for AI in traditional DP, proponents say



AUSTIN, Texas - Artificial intelligence systems may well be the wave of the future, but even proponents of that technology are uncertain of how it will fare in the world of traditional data processing.

"In what we now know as DP, AI will not find a place," said Dr. Joseph Dreussi, a member of the technical staff of Lisp Machine, Inc., which

markets Lisp processing equipment.
"But DP is changing. The so-called fourth-generation hardware and software showed people that they did not need a DP shop to get their information-related jobs done. Microcomputer spreadsheets are an exam-ple of that. Those fourth-generation tools are certainly not AI, but people are beginning to look at AI as an approach to that same issue on a scale broader than just spreadsheets," he said.

Dreussi was one of several au-thorities in the field of AI interviewed by Computerworld at last week's American Association for Artificial Intelligence National Conference on Artificial Intelligence (AAAI-84) held here. Despite the fact that he sees no role for AI in traditional DP, Dreussi said the push for adoption of that technology has come from both users and DP profession-

als.
"DP managers realize that they cannot hope to meet the future demands for information with the current tools. AI is not needed for existing applications, such as payroll systems. The current software technology works fairly well in that area. But AI will be needed for the more sophisticated applications that will arise in the future," he said.

Dreussi earned his Ph.D. in computer science with a concentration in AI at the University of Texas at Austin. Before joining Lisp Machine, he worked in the areas of robotics and problem-solving systems. His views on the future of AI in commercial DP were countered by Larry Geisel, pres ident of the Carnegie Group, Inc., an Al software manufacturing firm.

Some AI applications are already moving into production systems and have even replaced traditional MIS systems," Geisel said. "AI is being driven into mainstream markets because of the high paybacks it offers. Conventional DP techniques are only useful in satisfying a certain portion of a firm's information requirements. After a point, those traditional tools run into a barrier. AI can crack through that barrier with its fresh approach to information process-ing," he said. Geisel worked in the areas of software development and MIS management before founding the Carnegie Group.

According to Alexander Jacobson. president of Inference Corp., the AI applications that will move the technology into the mainstream are currently under development and should reach the market in the next two

Jacobson, who has a Ph.D. in electrical engineering, said the beauty of

Al lies in its generic nature, which makes any human task a possible ap-

"There are at least three main forces that will push AI into the commercial marketplace," he said.
"Hardware is getting to be dirt
cheap, and these powerful, cheap computers will have to be put to new uses. Also, there is a need to make computers do more than crunch numbers. Traditional systems are not adequate for nonprofessionals. Al can bridge that gap.
"The final factor is political. Pro-

jects in other countries are spurring research and investment in AI in the U.S.," Jacobson continued. "That investment means that products will be

available for new-applications.

But he and others admitted that it will take some time for users to overcome their apprehensions about the new technology. Jacobson said people are nervous about investing mon ey in Al systems, a factor that will hinder market growth. Lisp Machine's Dreussi expanded on the point.

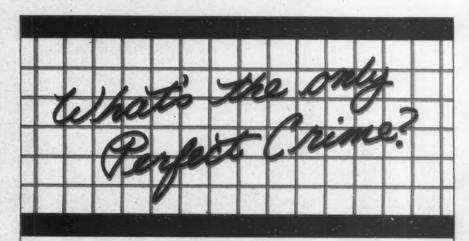
"Educating people is very impor-tant right now. When users see that AI isn't a mysterious, black-box kind of thing, it will begin to win acceptance. That is happening slowly, but it is something that you cannot force on people," he said.

The Carnegie Group's Geisel outlined another problem that may impede Al's commercial adoption.

The major limitation right now is in the area of skilled personnel who can implement these systems in cor-porate MIS departments. It will realbe tough to expand that base of

training and experience.

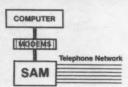
The three also conceded that the prices of AI products will have to fall before they become attractive to a wider user population. "We need a low-cost, effective delivery vehicle for AI applications," Geisel said. "We need a low-cost AI workstation and better communications capabilities to tie such a machine into the existing hardware and software base. That will make AI tools compatible with mainstream DP.



IT'S WHEN NO ONE KNOWS THERE'S

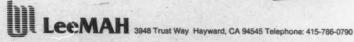
BEEN ONE. Computer crime is 10 times more profitable than robbing a bank. That's a fact. But, this statistic is only available on KNOWN computer crime...it's impossible to know how much monetary and informational theft goes undetected; some of it, perhaps, from your own system. The ability to access computers via dial-up ports is beneficial, but it creates a potential exposure akin to leaving the vault door unlocked. Disgruntled employees, strikers, malicious hackers and dishonest competitors can obtain information, vandalize the system, even misappropriate inventory...all from a push-button phone.

This high-risk threat of computer fraud has generated the urgent need for the LeeMAH Secure Access Multiport (SAM). SAM reduces your system vulnerability by allowing access to AUTHORIZED LOCATIONS ONLY via callback. SAM connects on the analog side of the modems. You can stop the perfect crime...with LeeMAH's SAM.



- Interfaces with any modem, any speed, any protocol.
- Provides audit trail including unauthorized access
- Has simultaneous multi-call handling capability. Is modular for both port and call-back directory capability.
- Masks computer from unauthorized callers
- . Up to 64 ports per system





Vendors see AI a stage in evolution, prepare for survival of fittest



CW AT

By John Gallant

AUSTIN, Texas — Traditional systems manufacturers entering the artificial intelligence product race said they see AI as simply the next stage in the evolution of computer technology. But they intend to have products ready to meet user demands in that rapidly approaching stage.

stage.

"We see AI as the next generation of general-purpose computers. There is nothing magic about it. If we want to continue to be a leading supplier of systems, we must offer AI tools to prospective customers and to our existing user base," said William Kaiser, manager of AI market development for Apollo Computer, Inc.

Kaiser was one of several systems vendor representatives interviewed by Computerworld last week at the American Association for Artificial Intelligence (AAAI-84) here. A supplier of workstations used primarily in computeraided design and engineering and computeraided software engineering, Apollo recently forayed into the AI marketplace with the introduction of its Domain Lisp version of Portable Standard Lisp for use on the company's Domain workstations.

"We do not like to look at AI as a market per se," Kaiser said. "We see it as where the industry is moving. If AI becomes the way of computing in the future, then the opportunities will be as big as the entire market for computers... Ultimately, we believe it will be the way people do business."

Kaiser's comments were echoed by Charles Piper, AI product marketing manager for Data General Corp.'s Technical Products Division. Like Apollo, DG is a recent entrant in the AI products race. The company demonstrated for the first time at AAAI-84 its Common Lisp Programming Environment, which operates on DG's Eclipse/MV line of microcom-

"I think companies that try to sell whiat they label AI products are in for a shock," Piper said. "People are not saying, 'I want aritificial intelligence systems.' They are looking for new ways to solve problems; they are looking for answers. We want to be ready to provide those answers. We aim to integrate AI technology into our product line for that reason. The Common Lisp envi-

ronment is the first step in

that process.

"Al simply represents an evolution in technology," Piper continued. "It is not this great split between old and new. It is one more stage in a continuum."

With a similar view of the future of AI technology, according to R. J. Mathew, Digital Equipment Corp. is taking an evolutionary approach to developing and marketing AI products. Mathew is a member of DEC's Artificial Intelligence Marketing Group. In addition to its recently introduced VAX Lisp and OPS5 AI products, DEC announced last week that it will jointly market with other manufactures six AI software products for use on the company's

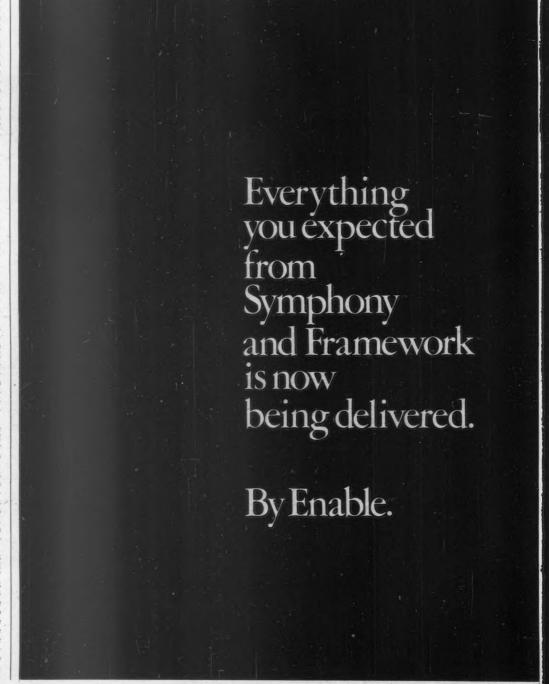
VAX-11 and microcomputer lines.

"DEC is primarily a systems manufacturer and supplier, and we will continue to address the market that way." Mathew said. "But we are moving in a careful, evolutionary manner toward AI because we want to take our customer base with us.

"We plan to let them ac-

cess AI technology through their existing hardware and software systems," he added. "We are taking that approach to allow users to maximize the return on their current investments." Mathew and his peers at

Mathew and his peers at DG and Apollo said that AI technology will likely make its first commercial inroads in the area of expert systems.



Researcher outlines natural language systems' potentials, problems



By John Gallant CW Staff

AUSTIN, Texas — One day in the future, computer systems will be equipped with user manuals that are

only one page long.

That, according to Dr. Wendy Lehnert, is the goal of natural language processing systems researchers, who are trying to make the wealth of computer-based data available to the widest possible range of users.

Lehnert is an associate professor of computer and information science at the University of Massachusetts and former vice-president of research at Cognitive Systems, Inc. During a session at last week's American Association of Artificial Intelligence (AAAI-84) here, Lehnert gave users practical advice on the selection and implementation of natural langementation of natural langementation.

guage processing systems and outlined some of the pitfalls involved in developing them.

According to Lehnert, onepage manuals will become a reality in the future, because true natural language processing machine interfaces will allow users to extract information from data bases using English or an Englishlike language without knowledge of the computer's operating procedures.

She said natural language processing systems will produce dramatic solutions to a variety of user interface problems in commercial DP applications.

But she cautioned prospective users to avoid what she called the "black box" problem in evaluating a natural language processing system. That problem arises when a user makes a quality judgment based only on the inputs that drive the system and the resulting statements with which it responds. "Without knowledge of

"Without knowledge of how a system handles inputs to make its outputs, you cannot hope to evaluate a natural language system properly," Lehnert said.

ly," Lehnert said.

To illustrate that point, she outlined two early systems that were described as natural language processors. The first provided a technical interface used by geologists to access a geological data base, and the second system offered responses similar to those a psychiatrist would advance when prompted by a user "patient."

While the second system seemed more sophisticated on the basis of its warm, personal output, Lehnert said, it was not a natural language processor at all. Rather, the system was a simple program utilizing key word pattern recognition that did little more than repeat user statements in a different format. The technical interface, while outwardly less elegant, actually worked as a true natural language system that processed user input to facilitate data base access.

"The [psychiatric] system is typical of the limited, trivial programs that are often labeled artificial intelligence," Lehnert said. "The [technical interface system] had to understand the input to answer the question and did not simply respond to word patterns."

Lehnert gave session attendees an opportunity to see firsthand the difficulties that researchers face in designing a true natural language processing system.

"Take for example the phrase 'the appearance of the man under the tree with a broken branch near the edge of the road to the town with a market.' While your mind can understand the meanings and the context of the words, that phrase has 429 syntactically possible interpretations that the natural language processor must consider in determining the most accurate meaning. That gives you some idea of the complexity involved," Lehnert said.

Think about it a moment.

If you were to sit down and design your own integrated PC software system, what would you aim for?

Wouldn't you want to be able to integrate information from all modules in one window right on the screen? And then print it?

Wouldn't you work at it until every module gave you the functionality of the very best stand alone programs?

Wouldn't you design each module to have its own appropriate file structure?

Beyond the brass ring.

Naturally, you'd also want it to run on a standard 256K PC.

It goes without saying that you'd want compatibility with the leading single-purpose programs.

And if you were to dream a bit, you'd go for concurrency because it would be great to do two or three jobs at the same time.

If you'd do all that in designing your own integrated program you'd certainly expect companies like Lotus and Ashton-Tate to do the same.

It didn't happen.

They left it all out. We put it all in.

And because we did put it all in, Enable lets you produce at levels far beyond Symphony or Framework.

Enable can integrate data from all modules in one window and then print or transmit it. For instance, you can create graphs from a spreadsheet or database. Then insert the graphs, the spreadsheet and DBMS data between text in a single word processing document right on the screen.

Functionality? Just as you'd do it, Enable's word processing, spreadsheet, database management, graphics and telecommunications are, without exception, equal to the leading stand alone business programs.

Further, Enable's files are not forced into clumsy or unsuitable structures. Enable isn't spreadsheet-based or document-based or DBMS based. Each module is designed for a specific application.

Symphony and Framework? Hardly.

More? There's more.

Your eyes blinked at our mention of 256K. Yet that's all you need to operate a spreadsheet with 136K of workspace. Or a word processing document whose size is limited only by available disc space. Or a DBMS file with up to 130,000,000 bytes of data.

We're sure you put a high priority on compatibility. So did we.

With Enable, you can use files from dBase II, Lotus I-2-3, VisiCalc, WordStar, Easywriter I and Volkswriter—all automatically, without conversion or rekeying. Then you can produce files in those formats for anyone who hasn't yet switched to Enable.

And you can work on your spreadsheet while you're printing a monthly report and receiving stock quotes over the wire—all at the same time.

How much good news can you handle?

It's time to admit there's one area in which Enable does not rise head and shoulders above Symphony and Framework. Price. We're the same.

And now for the next step.

Borrow a loaner copy from one of our dealers and give it a workout on your own.

Or, if you're a company with at least 25 PC's we'll send you a complimentary copy. No obligation

Once you're thoroughly satisfied with Enable you can trade up your Lotus 1-2-3 for \$200, your dBase II for \$400.

Just dial 1-800-932-0233. In New York dial 1-800-338-4646.

Will Enable live up to your expectations? Well, you designed it didn't you?

Integrated
software shouldn't
be a matter of
choosing which compromises
to live with.



For the IBM®-PC and selected compatibles.

Trademarks: Enable—The Software Group, IBM—International Business Machines Corp., Volkswriter—Lifetree Software, Inc., Easy Writer I—Information Unlimited Software, Inc., WordStar:—MicroPro International Corporation, dBase III, Framework—Ashton—Tare, Symphony, 1-2-3 and Lotus—Louss Development Corporation, VisiCale—Visicorp.

©Copyright 1984. The Software Group Northway Ten Executive Park, Ballston Lake, New York 12019

What is AI? Some views from the conference floor

By John Gallant

AUSTIN, Texas — One stumbling block in any discussion of artificial intelligence is defining exactly what constitutes AI. Computerworld gave visitors to last week's American Association for Artificial Intelligence (AAAI-84) National Conference on Artificial Intelligence an opportunity to express just what they think AI is

Brian Rees, artificial intelligence marketing manager, Europe, for Digital Equipment Corp. International, Geneva:

"That is an interesting question to ask of a person from Europe. The term AI is not used very often there. We tend to speak of these things as knowledge-based systems, which I see as simply a continuation of basic software technology.

"AI is an evolution of technology, not a revolution. Some people in AI say we will forget all that we have done before. But that is unreasonable. We are applying new tools to old technology to make use of all the information we have amassed. AI represents a radical departure from old ways of thinking, but it is nothing more than an evolution in technology."

Gary Goodman, director of research and development, Scott Instruments, Inc., Denton, Texas:

struments, Inc., Denton, Texas:
"The simple definition of AI is

that it is human intelligence that is machine-based. If a machine exhibits that type of intelligence, then it is artificially intelligent. The crux of the question is how to judge whether a machine shows intelligence.

machine shows intelligence.

"If the system can learn, perceive and make valid predictions, then it is exhibiting intelligence; it is showing human-like qualities. If people using the machine cannot determine whether they are interacting with a computer or another human, then the system clearly is intelligent artificially."

Ralph Butler, Ph.D. candidate in computer science, University of Missouri at Rolla:

"I see AI as a form of machine de-

sign that permits the computer to become a very good assistant to a human. I do not think a machine will ever be as intelligent as a person, but AI technology lets the system become a true helper. AI lets the system gain the knowledge of an expert in a particular field to make it a valuable assistant to a worker in that field."

Joseph Scullion, NCR Corp. liason representative, artificial intelligence program of Microelectronics and Computer Technology Corp., Austin, Texas:

"It is not really fair to ask what constitutes AI. There are as many definitions of AI as there are people to answer the question. The trivial answer is that AI allows machines to behave in the manner of human beings.

"A more complex definition of AI involves discussion of areas such as the behavior of learning, planning, making judgments, robotics and vision systems, to name only a few. The complexity of the technical sessions here gives you an idea of how much AI encompasses. The problem with easy answers is that they miss the point and spawn misunderstanding of what AI really is."

Virginia Lyons, manager of documentation, Ashton-Tate, Culver City, Calif.:

"Al involves a machine that tries to emulate human behavior. The machine has certain knowledge coded into it, and based on that knowledge, it makes decisions and provides responses to questions as though it was an expert, so to speak. That type of AI machine, while just coming into being, is not a new idea."

Rina Dechter, Ph.D. candidate in computer science at the University of California at Los Angeles:

"AI technology tries to make the performance of a computer appear similar to that of a human. The output should appear to one person as though it came from another. The form of the output, whether it comes from a voice system or a natural language processor, is not important. What is important is that it appears identical to human efforts."

Xerox launches AI systems unit

AUSTIN, Texas — In response to growing market demand for artificial-intelligence-based products, Xerox Corp. last week announced the formation of its Artificial Intelligence Systems Business Unit.

gence Systems Business Unit.
The announcement, made during the American Association of Artificial Intelligence (AAAI-84) National Conference on Artificial Intelligence here, stated that the new business unit is a response to what Xerox believes will be a significant increase in the AI marketplace during the next two to five years.

Xerox currently markets two models of AI workstations — the Xerox 1108 and the Xerox 1132 — each of which was designed for individual use and includes a variety of memory, processor and disk drive capabilities. The workstations utilize Xerox's Interlisp-D software.

Lotus on a VAX? Yes. 415-841-9594

Multiplan on a PDP -11? Yes. 415-841-9594

CP/M° on an HP -3000? Yes. 415-841-9594

WordStar on a VAX? Yes. 415-841-9594

SuperCalc on an Eclipse? Yes. 415-841-9594

MS°-DOS on a VAX? Yes. 415-841-9594

dBase II on a VAX? Yes. 415-841-9594





Yes. 415-841-9594

Ve can put your VAX, PDP-11, HP-3000, Eclipse or Nova to work running more software at more terminals than anyone.

We do it with The Bridge,™ a hardware/software add-on board that does remarkable things. The Bridge makes any system terminal (even dumb terminals) work like a virtual microcomputer.

You get to run the hottest micro software while keeping all the advantages of your minicomputer (speed, database, storage, etc.).

The Bridge expands your system in an orderly way, without overloading the host. It's a lot better than buying a bunch of microcomputers and trying to tie them together.

(It's also a lot cheaper.)

Virtual Microsystems is a crack outfit of hardware designers, software writers, systems consultants, and helpful support people located in Berkeley, Calfornia. We even have a salesman.

Ask for Dan.

virtual **microsystems**

"The Bridge" People" 2150 Shattuck Avenue, Suite 720, Berkeley, CA 94704

Trademarks. The Bridge—Virtual Microsystems. Lotus—Lotus Development Corporation, Multiplain—Microsoft Corporation, dasse—Ashton Tate; VAX, PDR. Eclipse.

Nova—Digital Equipment Corporation. HP—Hewlett Packard Registered Trademarks. CPIM—Digital Research, Inc.: WordStar—Micropro; SuperCalc—Sorrem MS—Microsoft Corporation.

RUTH DAVIS

After a long and illustrious government career, Dr. Ruth M. Davis made the jump to the private sector when she launched her own consulting company in 1981. Some of the posts Davis has held include Director of the Institute for Computer Sciences and Technology at the National Bureau of Standards; Assistant Secretary of Energy; and Undersecretary of Defense in charge of Research and Advanced Technology. Davis long list of honors and awards includes Department of Energy Distinguished Service Medal (1981); the Department of Defense Distinguished Service Medal (1979); honorary doctorate of engineering from Carnegie-Mellon University (1979); and the Data Processing Management Association Computer Science Man of the Year Award (1979).

In July, Davis took a few moments out of her hectic schedule to tell Computerworld's International Editor, Susan Blakeney, her observations on computing and the government and

her role in each.

O In 1979, when you were Undersecretary of Defense for Advanced Technology, you told the Data Processing Management Association that you thought not enough DP professionals were in high, influential corporate positions or in influential positions in government. Do you still think that's true?

Yes, I think it's true — I know it's true — for both men and women. It's been absolutely amazing to me, with the computer industry so dominant and with everything from national security to our checking accounts dependent upon computers, we have so few people in policy-level positions that have any real, substantive knowledge of that field.

I think the reasons are severalfold — and I believe they'll disappear shortly. You normally went into the political world through the legal profession and/or the management field . . . and there was only one engineer in U.S. Congress in 1976. The fields of law and management have always been afraid of science and technology.

There has only recently been this nice, hybrid profession where you get a degree in engineering or in some scientific field and also a law degree. You've had hardly any scientists or engineers in Congress or in legislatures — that's beginning to change gradually as more scientists and engineers recognize that if you're going to exert influence, you can't do it from within the profession.

In the management of corporations and government, people were either, again, generalists, or if they were technical, they were from the traditional scientific and engineering field — physics. Almost every senior [R&D] policy official was from physics or chemistry for many, many years. And they very definitely tried to keep out the computer scientists.

You think it was a conscious decision to keep them out of policy-level positions?
Yes...it was not an admitted conscious decision, meaning that they didn't get together and say, 'We're not going to let computer scientists or engineers in.' It was just a subtle, unadmitted kind of decision.

I've heard so many times: 'Well, you can't have a science devoted to computers because a computer is a machine — so you can't have a science built around a machine.' That's absolute non-sense.

Computer types have, however, generally been

very narrow. They've generally not had Ph.Ds, and they generally haven't branched out into other fields. Their greatest goal has been to be head of the computer center. They've let themselves be looked at as second-class citizens when it comes to policy or decision making or management. That has been changing within the last four to five years . . . it isn't changing very fast.

O In 1982, when the national economy was in the throes of a recession, you spoke at the National Computer Conference on 'A Computer Antidote for our Economic Ills.' What did you mean by that, and do you think the computer has provided the antidote?

Computer science and technology was the prin-



ciple area in which we were still the leaders in the world marketplace. That is not now generally true — you cannot make that statement [now] because the Japanese have swung in very hard.

But where there has been any real advance in architecture, or in products and speeds or characteristics of computers, we still hold the lead. Supercomputers, [for example]: We're still going to make it [first]. . . And in the more basic areas of engineering — physics, surface chemistry changes as we go to gallium arsenide — we'll be able to make them work. The Japanese will be able to produce gallium arsenide, but we'll be able to translate it into faster processing speeds.

Good management and productivity really depend on computers, whether you're talking about [computer-aided design and manufacturing] or manufacturing technology, or the production industry or whether you're dependent on records management and record keeping in the service industry. The computer has provided the economic antidote for us, but it's also providing it for other countries.

Q How has computing in the government changed during the various White House administrations that you've seen?

Oh, I think the administrations in the government have had little impact on computing. I think the government and computing have changed at the speed that computing will allow, which is dif-

ferent [faster] from any other sector in the country. This is because the government has been the principle funder of computer R&D since its inception. It has been the principle innovator. That is still generally true. The only time [the government] gets behind is when Congress passes legislation that arbitrarily restricts it.

Q What have been some of the most dramatic technology changes that you've witnessed over the years?

First was the jump in supercomputers . . . the massive power of parallel processing; the speed of processing for large computational functions has just been dramatic. The second [change] is networking, which came [out of] government activities as well as government funding. Networking, I think, has changed the whole world. Banking is no longer domestic, information systems are no longer domestic, venture capitalism — real estate — nothing is domestic in the country because of networking.

of networking.

Another main area [of change] is in real-time control, which translates into manufacturing technology now and into space [applications]. That's the one that probably excites me most—the ability to use computers with real-time control of very complex activities—whether it's medicine or space. And then, the development of sensors—humanoid sensors with hearing or vision as well as touch.

Q Is it generally perceived that it's hard to keep computer or DP professionals in government, when they can make so much more in private sectors?

It depends . . . why don't we change the term 'DP professional' to 'computer scientists and engineers?' [The government's] not keeping them. But don't forget, most of the R&D work was done under contract to the government by the aerospace and the defense industries. So they can do the same kind of work, and we all benefit anyway . . . and the goals are the same. The government doesn't lose.

Q What do you mark among your greatest professional disappointments?

The greatest one — the one that stands out above all others — is one that has happened to me three or four times. And that is I've always been a year to two years behind my male counterparts in getting the next job at the next higher level. I felt I should have been director of an organization a couple of years ahead of when I was.

Ob sure—one always does. You keep thinking, what if you had tried harder—even though you were a woman—maybe you could have made it. I had a guilt feeling all my career that I wasn't doing something right. I've never been comfortable with my career. I like that [humorist] who said, 'Guilt is the gift that keeps on giving.'

Q What do you mark as your greatest professional accomplishments?

I think the ability that I had at the two policy-level positions I held in government to really advance this country in several major areas. I'll give you the one you'd expect least first so you don't forget it — and that's [the development of] synthetic fuels which I really started in the Department of Defense and really pushed. We're [going to] need it. The other one is the advancement of computers for both national security and national welfare. That covers health and defense. I think that's what made me really feel great — I was able to do something.

Automated security system controls access to Olympic venues

LOS ANGELES An unpleasant surprise recently befell an adventurous sports fan who tried unsuccessfully to outwit the 23rd Olympi-ad's high-tech security system and sneak into some of the event's restricted loca-

The Summer Games were

only a few days old when one of its more than 90,000 accredited visitors approached a popular Olympic venue with the intention of going inside. Casually flashing his official identification badge to a security guard, the visitor fully expected to be admitted to the venue without incident.

But to his amazement, his

request to enter was denied, and his credentials were summarily confiscated.

The reason for the unexpected trouble soon became apparent. For security reasons, Games officials issued several categories of ID badges, some of which per-mitted wider access to Olympic facilities than others. Somehow, at least one of the event's accredited visitors had persuaded a credentials officer to issue him the wrong kind of badge, which gave him entry to sites that were supposed to have been off limits.

At any other Olympics, the visitor's deception almost certainly would have gone undetected. Here, however, the ruse was thwarted.

"When [the would-be interloper] was suddenly deprived of his credentials and was told he was barred from the venues entirely, he be-came very upset," according to Mike Mount, a vice-presi-dent with the Los Angeles Olympic Organizing Commit-

What reportedly undid the hapless visitor was an auto-mated security system that used light pens and bar codes to control physical access to the quadrennial event's three Olympic Villages and 22 venues. The system was the first of its kind in Summer Games history, according to Jim Murray, the Los Angeles Olympic Organizing Committee's vice-president of technology.

Each of the 93,000 committee staff members, ath-letes, coaches, media representatives, contractors and other accredited Olympic visitors was issued his own laminated identification bearing the recipient's name and photograph. Also printed on the badges was a ma-chine-readable bar code similar to the ones that are scanned in supermarkets by electronic checkout systems. Each badge bore its own unique bar code.

To gain access to a desired Olympic site, an accredited visitor first had to present his badge to a security guard, who then scanned it with a bar code reader from Canton, Mass.-based Computer Identics, Inc. At least one such scanning system was in-stalled at each Olympic Village or venue entrance.

After deciphering an ID card's bar code, the scanner consulted its local memory to find out whether the badge holder had been granted access to the site he was seeking to enter.

In the past, Murray recalled, security guards at the Games tried to spot attempt-ed intrusions by "comparing people's faces [with] the pictures on their badges. It was a mainly visual process and wasn't very effective."

This year, however, the procedure for weeding out suspected trespassers worked differently. badge was reported missing, committee officials quickly invalidated it by updating their central credentials file, which contained the name of every accredited Olympic visitor and specified the loca-tions each individual was authorized to enter. The credentials file resided in an IBM System/38 at committee headquarters.

From the System/38, notice of any badge invalidation was copied onto 514-in. floppy diskettes and then transferred first to IBM Personal Computers and finally to the bar code readers.

USL DATA SYSTEMS: THE SOURCE FOR DATA PRODUCTS.

to avoid obsolescence and preserve capital equipment budgets.

with much quicker delivery than most manufacturers.

Whatever options you choose in acquiring equipment, we back up every shipment with service. That means you can count on us for total product support, including maintenance and prompt followup on any problems or questions.

Business Computers/ Microcomputers

Digital Equipment Corporation

Hewlett-Packard IBM TeleVideo

Wang **Terminals**

ADDS Beehive

Datastream Digital Equipment Corporation Hewlett-Packard IBM

Lear Siegler Teletype TeleVideo

Printers

Centronics Datasouth Diablo

Digital Equipment Corporation

Teletype TeleVideo **Data Communications**

Hewlett-Packard

Okidata

Printronix

Equipment Anderson Jacobson Rixon

IBM Compatible Controllers Datastream Teletype

Nobody offers more.

USL Data Systems

A U.S. Leasing Company

USL Data Systems 2988 Campus Drive San Mateo, CA 94403 Phone: (415) 572-6600

© 1984 USL Data System

Call your local sales office for price & delivery quotations.

DISTRICT OF COLUMBIA 301/258-0220

MENNESOTA (800) 323-7961 MESSESSEPPI

Smart Software is smartest choice.

Lotus' Symphony was the hands-down loser and little known Innovative's Smart Software the surprise winner in an integrated software face-off that also included Ashton-Tate's new Framework package.

InfoWorld

ComputerLand of Arizona's major corporate accounts came to preview Symphony and Framework last month but went home talking about Smart Software.

PC Week

In an integrated software showdown, Smart Software was the overwhelming victor according to the 35 corporate decision makers who participated in this thorough capabilities evaluation.

The final concensus: At this point, Symphony deserves no encore and Framework was not in the picture. But clearly, Smart Software—featuring The Smart Spreadsheet with Graphics, The Smart Word Processor, and The

Smart Data Manager—is the best and the brightest among the top integrated software contenders.

Find out why smart people are praising Smart Software. Ask your dealer for an enlightening demonstration, or call 800-GET-SMART for information on our Smart demonstration disk.

Smart Software, available for the IBM PC/XT and compatibles, is the smartest software choice you can make.



Smart Software from Innovative Software, Inc.

MIS personnel chair micro policy committees: survey

CHICAGO — According to a survey answered by 1,339 members of the Association of Information Systems Professionals (AISP), MIS department personnel are most often assigned to supervise internal company committees charged with recommending microcomputer equipment, developing networks and updating current systems.

updating current systems.

A number of different departments are usually represented on the internal committees, according to the survey presented here at the recent AISP-sponsored Syntopican XII Conference and Exposition.

Market Probe International, Inc. of New York conducted the survey for Newsweek magazine. Questionnaires were mailed to 3,000 AISP professionals between April 27 and June 8.

Profile

The sample profile showed that of the respondents, nearly 75% were female, the average age was 38, over half were college graduates, one-fifth had graduate degrees and the average annual personal income was approximately \$45,000. The most common areas of work for respondents were word processing (37%), information systems management and office management.

Other findings were:

■ Partial decentralization of information and data processing activities was reported by 32% of the micro user respondents.

■ A total of 24% reported achieving greater independence from centralized word processing or DP departments.

■ Word processing was the primary application of 57% of respondents, followed by education and training, communications, data base management and data input/analysis.

Electronic mail and communications are expected to become additional applications of micros in the work place.

■ In spreadsheet software, Visicorp's Visi Calc and Microsoft Corp.'s Multiplan were most often mentioned, and Micropro International Corp.'s Wordstar was mentioned three times more than any other word processing software.

The single most frequently reported package was Lotus Development Corp's 1-2-3, and among data base management packages, Ashton-Tate's Dbase II was most often mentioned.

■ In micro makes, IBM was used by 59% of users; Apple Computer, Inc. micros by 37%; Wang Laboratories, Inc., 17%; Radio Shack Corp., 17%; Digital Equipment Corp., 13%; Compaq Computer Corp., 12%; Hewlett-Packard Co., 9%; and Xerox Corp., 6%.

Corp., 6%.

The most popular micro models cited were the IBM Personal Computer, the IBM Personal Computer XT, the Wang Professional Computer and Xerox models.

■ Problems most frequently cited in trying to achieve the best use of micros included: achieving compatibility with existing computers, integrating micros into company routines, training and retraining users and acquiring appropriate software and peripherals.

The survey is available for \$25 (check payable to Newsweek, Inc.) from Advertising Resource Center, Newsweek, 444 Madison Ave., New York, N.Y. 10022.

Autofact 6 to target CIM

ANAHEIM, Calif. — Computer-integrated manufacturing (CIM) will be the focus of the Computer and Automated Systems Association of the Society of Manufacturing Engineers' (CASA/SME) Autofact 6 Conference and Exposition to be held at the Disneyland Hotel and Anaheim Convention Center here Oct. 1-4.

According to the sponsor, the theme of the Autofact 6 conference will be "CIM — Manufacturing in the Information Age."

Among the scheduled speakers for the conference's opening session are: John Hall, president of CASA/SME; Capt. Walter Schirra, former astronaut and an independent consultant with Morrison Co.; Dr. William Spurgeon, program manager for production research with the National Science Foundation; and Fred Houtz, manager of engineering for AT&T Technologies.

Session topic

Conference sessions will cover a variety of topics, including "Expert Systems," "Numerical Control," "Networking," "Common Data Bases," "CIM for Small Business," "Microcomputers," "Planning and Modeling for the Factory of the Future" and "Shop Floor Control." Three evening forums will be held on the subjects of "Human Resources," "Artificial Intelligence" and "Education."

The cost to attend the full conference is \$450 for CASA/SME members and \$520 for nonmembers.

More information is available from the Technical Activities Department, SME, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.



Environments which are user friendly produce friendly users. Make a friend!

How to stop the grumbling

MANAGER SOFTWARE PRODUCTS'
CONTROL MANAGER* rids your users of the never
ending task of having to learn how to interact with yet
another software product. It enables them to match the
functionality of a software product with their specific
requirements, while at the same time removing the need
for them to become 'syntax' knowledgeable.

Meet the MANAGER family

CONTROLMANAGER is truly integrated and being a member of MSP's MANAGER Family, is totally discounting the control of MSP's MANAGER is initially available exclusively for the other members of the MANAGER Family. These include DATAMANAGER, the data and information resource management system, DESIGNMANAGER," the logical data base design and information modeling system and SOURCEMANAGER, the Cobol application development system.



MANAGER SOFTWARE PRODUCTS INC

Offices worldwide: Australasia, Benelux, Canada, Italy, Japan, Scandinavia, Spain, Switzerland/Austria, U.K./Eire, U.S.A., West Germany.

DATAMANAGER is a Reg

Interface with ease

CONTROLMANAGER is the interactive interface between the person, the machine and the software. It provides automatic navigation for the user to get where he wants to be. It is simply and logically tailorable.

Lets get together

Find out how CONTROLMANAGER can help you make friends with your users.

Send the coupon today or call (617) 863 5800 (Telex 710 326 6431).

CONTROLMANAGER DATAMANAGER	☐ DESIGNMANAGER ☐ SOURCEMANAGER
Name	Title
Company	
Address	
11-13-	
Address City/State/ZIP Code Telephone Number (
City/State/ZIP Code) SOFTWARE PRODUCTS INC,

Nevada courts to undergo extensive computerization

By Edward Warner CW Staff

CARSON CITY, Nev. — In what is said to be the most extensive program of its kind in the U.S., the state of Nevada is computerizing its court system and linking most of its computers with a central data base that will provide judges with up-to-date criminal records for defendants brought before them.

When the state's Uniform Register of Actions (UROA) computer system — expected to cost from \$300,000 to \$500,000 — is up and running a year from now, it will provide all of the state's courts with terminals and printers linked to supermicrocomputers at regional centers. The supermicros will run record-keeping software, store records and be linked with a central data base to be established here in the state capital. Most courts will also get on-site micros for WP and bookkeeping functions.

The central data base will the together the far-flung courts of this large, rural state so that a judge in Las Vegas will, for example, know that the accused drunk driver brought before him had been convicted on the same charge only days before in Winnemucca.

Currently, said Harry Lipparelli, deputy director of the state's administrative office of the courts, the Las Vegas judge would be unlikely to have such up-to-date knowledge at hand and might hand down a lesser sentence than the state's rigid anti-drunk-driving law requires. Drunk drivers convicted of their third such offense in the state receive mandatory prison sentences.

But the biggest benefit of the new system, Lipparelli explained, will simply be to help the state's courts get out from under a costly and cumbersome burden of paperwork. "It's too expensive to keep records on these old docket books," Lipparelli said, adding that the computers will also let courts determine where scheduling logjams are developing.

The entire computer system is being provided by-Alpha Microsystems, Inc., an Irvine, Calif., vendor of legal and other vertical market systems, through its Carson City dealer, Jimwest. Approximately 150 Alpha Microsystems AM60 terminals—at least one for each court—will be used in the system, some of them right in the courtroom, Lipparelli noted.

Alpha Microsystems' 70Mbyte AM-1092 supermicro will be used at an as-yet-undetermined number of regional centers, a 70M-byte AM-1072 supermicro will house the state-level data base and several 30M-byte

AM-1000E micros will be used by the local courts as on-site processors, a Jimwest representative said.

The system's cost will be mostly paid for by a portion of the state's year-old, \$10 "administrative assessment" being levied against people convicted of misdemeanors or violations of municipal ordinances.

Those offenders can have the dubious pleasure of knowing that exactly \$2 of that assessment will go toward purchase of the court system's computers and the maintenance of the statewide data base that will house their criminal records.

Although the state's computerized court system was authorized just over a year ago, the first implementation of the system — set for the town of Battle Mountain — is still not yet fully on-line, and court officials throughout the state are still mulling over the form their local systems should take.

At the Battle Mountain Justice Court, Deputy Court Clerk Ruth Bishop said the system's software for track-

ing traffic citations, including the revenue and bench warrants they generate, is running, but the software for the court's bookkeeping and other functions has yet to come on-line.

The Battle Mountain Justice Court's computer system may be typical of that planned for lower courts in See COURT page 26

A FUTURE.

The future

Very few data communications managers have the time to think about it. And even fewer data communications companies want to discuss it.

While we at Codex don't claim to have a crystal ball, we feel that not knowing what the future holds is no reason to be unprepared for it.

Which is why everything we do centers around one objective: putting you in the position to solve your organization's information needs. No matter how large, how complex, or how much they change.

This is evident not only in our dedicated central site control systems, but with our modems, multiplexers, network processors, switches and local area networks which deliver monitoring and control capabilities, enhancing network performance and flexibility.

It's also evident in our people, who can help you interconnect devices with various protocols, speeds, even dissimilar architectures.

The fact is this: for more than 20 years we've been helping people solve the future everyday. To the point where today Codex equipment can be found in 90 of the Fortune 100 companies.

See how far Codex can take you. Call **1-800-821-7700** ext 890. Or write Codex Corporation, Dept. 707-90, 20 Cabot Boulevard, Mansfield, MA 02048.



in September, see us at the Federal Computer Conference and TCA.

© 1984 Codex Corporation

The SAS System.

re your users demanding faster service and more business expertise than your data processing staff central offer? Is your DP earl demanding relief from its applications backlog? Is your management demanding lower development and maintenance costs? Put the SAS* System in your information Center and you can meet all these demands.

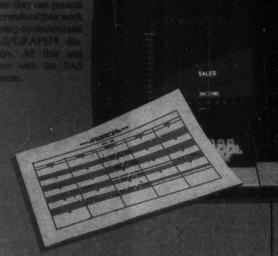
The SAS System is the one. vour Information Center needs.99

The SAS Solution for End Users

Your marketing stuff can use the base SAS® product for sales. reports and analyses. Sales representatives can use the full-screen capabilities in our SAS/PSP® product to manage their prospect files and the personnel department can keep track of employee and applicant records.







ith the SAS System, users only need to learn one language to accomplish all their tasks, and you only need to maintain one set of files for their needs. And set of easy-to-read manuals and training aids. If they need

public training courses or you can schedule an in-house course can call us. Our full-time staff of specialists is ready to answer your questions.



66 Our services help guarantee that our software will make you more productive.99

The Solution for Your Information Center

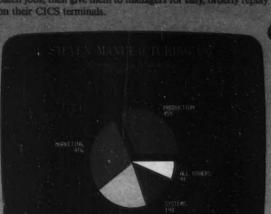
The SAS Solution for Programmers

Once your Information Center is equipped with the SAS System, your DP staff is free to use SAS programming tools to develop complicated reports and analyses, measure hardware resources or system usage, and accomplish many other jobs. Data base administrators can use our SAS/IMS-DL/1* in the street of the stre

terface to build test data bases and DL/I programmers can implement their IMS-DL/I applications using the simple SAS

And with our new SAS/REPLAY-CICS SAS/GRAPH dis-

batch jobs, then give them to managers for easy, orderly replay



The SAS Solution for You

The SAS System runs on the corporate hardware you've already installed so there's no need to purchase additional equipment for all your new users. The SAS System runs on IBM 370/30xx/43xx and compatible machines under OS, VM/CMS, DOS/VSE, SSX, TSO, and ICCF. The SAS System also runs on Digital Equipment Corporation's VAX^{rs} 11/7xx series under VMS^{rs} and And we are conand developing our software for new state of the art hardware.



66In short, the SAS System gives you everything you need-at a price you can afford.99

> So put an end to the demands. Send the coupon or call us today for the solution to your Information Center needs.

> SAS Institute Inc., SAS Circle, Box 8000, Cary, NC 27511-8000, USA. Telephone (919) 467-8000. Telex 802505.

Outside the US, call our subsidiaries in the United Kingdom, West Germany, France, New Zealand, Australia, and Singapore, or our distributors in Japan, Italy, Israel, South Africa, Brazil, Colombia, Singapore, and Saudi Arabia.

☐ I want to learn more. Send me The SAS Solution packet.
 ☐ Have a sales representative call me today!

Please complete this coupon or attach your business card.

Company

Address

City

Phone (

Hardware

Operating System

SAS Circle, Box 8000, Cary, NC 27511-8000



Survey links workers' ailments to management factors

STAMFORD, Conn. — Health problems among VDT operators are more likely to stem from poor working conditions than from the terminals, the Data Entry Management Association (Dema) charged after a recent survey.

More than 60% of the 352 Dema members polled reported problems of eyestrain, back pain, fatigue and neck or shoulder pain.

But the VDT operators linked their allments to inadequate working conditions such as poor lighting, uncomfortable chairs and poor management treatment of workers, not to the terminals, according to Dema President Norman Bodek.

Dema, which is based here and

represents 1,600 data entry managers, supervisors and operators, mailed questionnaires to workers in 26 U.S. and Canadian companies in May. Those questionnaires asked the workers if they were currently experiencing any of 12 listed symptoms. Dema received responses from 352 VDT operators and from 140 clerical workers who do not use VDTs.

The survey forms also asked the workers for comments that focused on the probable cause of the medical problems and on what individual companies have done to reduce problems.

Terminal operators complained of eyestrain in 68.7% of the responses, and 61.7% of the clerical workers

suffered from the same ailment. Respondents commented that in some companies, proper lighting and the use of mesh screens have reduced glare problems associated with VDTs and that paper, particularly photostatic copies and computer printouts, reflects light.

Back pain and fatigue

Back pain was a problem for 67% of the operators, but for only 36.2% of the clerical workers. Fatigue plagued 62.1% of the operators and 53.9% of the clerical workers, and neck or shoulder pain bothered 61.8% of the operators and 46.8% of the clerical workers.

Respondents and Bodek blamed

the fatigue and pain on the types of chairs that workers use and the amount of time that workers must sit. Bodek noted that clerical workers often do not sit for the extended periods that VDT operators must, accounting for the almost double incidence of back pain for operators.

Operators commented that proper back supports, foot rests and rest breaks with stretching exercises reduce back problems and fatigue.

Other survey results included complaints of burning or irritated eyes from 44.4% of the operators and 44% of the clerical workers, general irritability from 39.9% of the operators and 26.2% of the clerical workers, blurred vision from 36.5% of the operators and 24.8% of the clerical workers, arm or leg pain from 35.3% of the operators and 17% of the clerical workers, nervousness from 27.6% of the operators and 19.1% of the clerical workers, stomach pain from 11.7% of the operators and 9.2% of the clerical workers, swollen muscles or joints from 11.4% of the operators and 11.3% of the clerical workers and skin rashes from 6.8% of the operators and 5.7% of the clerical workers.

Bodek blamed the health problems on what in many cases may be sweatshop working conditions. "We managers have spent so much time and energy on making the jobs so routine and have placed so much emphasis on output that we've neglected our most important resource — our people. And then we're surprised when we discover that we are the major obstacle to our people's productivity. What's the root cause of these problems? Chairs? Lighting? I don't think so. I think it's management's attitude that is the source of these types of problems," Bodek said.

Federal meet set for Sept. 18-20

WASHINGTON, D.C. — "Harnessing ADP Technology" is the topic of the Seventh Annual Federal Computer Conference, to convene here Sept. 18-20 at the Washington Convention Center.

Kenneth Olsen, president and founder of Digital Equipment Corp., is the keynote speaker for the program, which is sponsored by the National Council for Education on Information Strategies.

During the three-day program, 130 federal and industry representatives will conduct full-day seminars and half-day sessions on topics such as microcomputers, software strategies, networks and technology assessment. Management briefings and product workshops will also be part of the program.

More than 250 firms are expected to demonstrate their equipment and services at this year's conference.

Registration fees range from \$95 for federal employees attending the day-long main conference program to \$395 for nonfederal personnel attending the full three-day program.

More information is available from the Federal Computer Conference through P.O. Box N, Wayland, Mass. 01778



The only way to lock in data, and lock out intruders, is to interlock hardware and software.

H ardware alone has never solved

the problem of data insecurity. Neither has software alone.

Y et year in, year out, there's always a new solution based on one of the two. Few claim to be the ultimate solution. Each claims to be different. It's a seller's market. Let the buyer beware.

Security paranoia

L et's face it: Anything important enough to put in a computer for fast analysis and retrieval is important enough to protect. Dishonest insiders—or worse, incompetent ones—will create chaos if you don't protect it. As will knowledgeable outsiders up to no good. When everybody is out to get you, paranoia is just good thinking.

And there are a variety of ways they can get you, too. There's scanning. Weaving through networks. Sending Trojan horse programs within electronic mail. Data diddling. And of course, trap doors, back doors and open doors.

Once in, there's all sorts of ways an illintentioned soul can cause havoc. Like browsing through records that are highly confidential. Data diddling with these records. Stealing them. Or just plain destroying them.

Old guard not working

A s previously stated, there are many hardware and software solutions. Each gives some degree of protection. Each has drawbacks. Dial-back systems are costly and inconvenient. Password schemes tend to be too easy to defeat. By the same token, a dedicated file server is of no help when the elite passwords

are discovered. Then there's encryption.

Costly encryption. Confusing encryption.

arrying any of these old-guard "solutions" to extremes can cause user rebellion—or even lock you out of the system.

The cavalry has arrived

I t's not software. It's not hardware. But the synergism of both. Codercard™ has developed a device slightly larger than a credit card that contains a self-powered microprocessor, 128 bytes of RAM and 2K of ROM. Each card contains a unique ID, and a complex series of algorithms that are key to the authorization process.

A pplication is simple. The user just inserts the card into a base unit that connects to his terminal. The host computer then checks for ID validity. If the card is valid, the host starts the algorithm process. Both card and host must arrive at the same answer.

S ince there are over 400 billion non-linear combinations possible, accidental discovery of the correct answer is quite a long shot. A 400-billion-to-1 long shot. And any attempt to compromise Codercard electronically, or by physically disassembling it, will render the card useless. Which quickly foils dedicated attempts by computer experts to discover the correct answer to the authorization process.

A s you can see, Codercard has gone to great lengths to hack out the hacker. Key to this accomplishment is the successful interlocking of both hardware and software. Anything less is truly less. And anything less just isn't enough.



2902 Redhill, Suite 160, Costa Mesa, CA 92626 Telephone: (714) 662-7689

Bug in jury selection system picks on one town's citizens

By Maura McEnaney CW Staff

BOSTON - The jury is still out on the exact reasons behind a computer foul-up here that caused the state of Massachusetts' computerized jury selection process to summon a disproportionate num-ber of residents from Malden, a community just north of Boston.

The jury selection process has significantly aided the Massachusetts Office of the Commissioner gradual implementation of the nation's first "one-day,

one-trial" statewide jury system. Under the new system, scheduled to be in full swing within five years, there are limited exceptions for jury duty dismissal, and sumjurors must moned jurors must sit through one day of selection or through one trial.

Using annual residential street listings and a Burroughs Corp. B6800 mainframe, the jury commissioner's office compiles data bases of potential jurors in three of the state's 14 counties and is responsible for sending out approximately

computer-generated summonses each week, according to Joseph Countie, data base manager. The result, Countie said, is jury pools that correspond with the population mix in each county.

But the system recently caused some headaches for DP professionals when its randomized selection turned out to be not so random. Last month, jury pools in Middle-sex County (1980 population of 1,367,034) consistently contained an abundance of jurors from Malden, with a population of about 53,386.

According to published reports, one day in June, 42 or 37.5% - of the 112 jurors summoned to Middlesex Superior Court were from Malden, even though the community makes up only 3.7% of the county's population.

Countie said the depart-

ment became aware of the problem only when "we be-gan to notice there was an extraordinarily large amount of mail [going out] to Mal-

Last week, Countie and in the department were still trying to determine exactly what had gone wrong

with the system and its selection process. One possibility, Countie said, was a problem with a mathematical formula called Randu, used in the inhouse program to select potential jurors randomly for each city or town. When selected, a percentage of the names are shuffled and fed into a county data base from which the jury pools are se-

According to Countie, there could have been a problem in the program's shuffling system when the names were first shuffled last fall. Each county is shuffled separately, and there have been no problems with other counties, he said.

Jury Commissioner Paul added, "Something must have happened when

Middlesex was on-line. We put it on Friday, and it took a whole weekend to run. Maybe it didn't go to the end of job or crashed along the way."

Besides, Carr said, it is far more important that the county's 125,000 jurors were originally randomly selected (which they were) than that they were called at random which they weren't). Ideally, the department first se-lects jurors randomly, puts all those names into a data base, shuffles and calls names in a way that should be random again.

Countie said he has re-written the program and reshuffled the names that have not yet been called. "I'm prepared to shuffle two or three times," he said.

3270 BISYNC DIAL-UP HARDWARE

- Killing Telephone Lines
 Killing PC Capabilities

No Operator Intervention

Incredible Purchase Price

Dial-Up Statistics

· 30 day free trial-no

obligation!

TSC introduces the Bisync Dial Line Manager (BDLM), the "software" 327X BSC dial-up solution, for users in an MVS or VS1 environment running VTAM/NCP. Some BDLM benefits include:

- · Elimination of leased line costs
- No Hardware
- · PC BSC user "dial-in"
- capability

To order or inquire about BDLM dial-up now at:

Technologic Software Concepts, Inc. (714) 730-1290

COURT from page 21

Nevada towns: an Alpha Microsystems AM-1072 microcomputer acting as host and linked with five Alpha Microsystems AM60 terminals, a modem, a printer and a videocassette recorder used to back up the system and store

software. Large Nevada cities, Lipparelli noted, will have more extensive systems and may even adopt the computerized management software now in use in Las Vegas for its one-day, one-trial pro-gram. Jurors there, Lipparelli explained, are contacted by letters generated by that court's computer (not a part of UROA) that tell them when and where to appear for jury duty.

The computer virtually guarantees that jurors will serve on the day they are scheduled and only on that day. It even generates thankyou letters to the jurors after they have performed their public service.

The Las Vegas jury system is "literally saving thou-sands of dollars," Lipparelli said, and its software will be adopted by the UROA system for use by other courts.

Other software that will be available under the state's computerized system includes that for bookkeeping, word processing, statistical analysis and the creation of electronic forms, which will replace the plethora of paper forms presently in use.

Disc Pack Cases Mag Tape Reel Cases





#5126 1 to 14 Th

PROFESSIONALISM IS A COMMITMENT CERTIFICATION THE TEST

rome institute for Certification (Corpoler Professionals (ICCP) has scheduled the 1984, CERTIFICATE IN COMPUTER PROGRAMMING (CCP) Examination for December 8 at test centers throughout the world. Designed for experienced programmers, the examinations are constructed

to measure knowledge in each area of specialization— business, scientific and systems programming.

Application deadline is November 2. Give yourself sufficient time to review your knowledge by sending in the coupon today.



Institute for Certification of Computer Profes 35 East Wacker Drive - Chicago, Illinois 60601

CW43

205 Livingston Avenue New Brunswick NJ 08901 (201) 928-4499 Microframe, Inc. DEAR HACKERS: You have caused much expense and damage.

By the looks of things, you've only just begun.

We at Microframe have developed a device to
KEEP YOU OUT. It's called <u>DATA LOCK & KEY.</u>

With a <u>DATA KEY.</u> access ie effortless. Without with a <u>DATA KEY.</u> access is effortless. Without into any type of system if it is protected by a <u>DATA LOCK.</u> You have caused much expense and damage Our own computer is protected by a DATA
LOCK We invite you to dial in (201-8287120). You will be answered by a 1200 BAUD
MODEM. The data we gather from your efforts
will help us to ensure that our DATA LOCK &
KEY is the best protection available. HACKERS CAN BE USEFUL HELP IS AVAILABLE For clues, just call our voice line (201) 828-4499 and ask for DATA SECURITY. Thank you. MicroFrame Ing.

"How I increased user satisfaction with the flick of a switch."



Introducing The Honeywell Solution Center.

Now there's a way you can increase the satisfaction of your end users and improve the responsiveness of your information management system. It's called a Solution Center.

A Solution Center is a user-support facility that enables personnel throughout your organization to do their own data processing, quickly and easily. And it enables you to give them direct but controlled access to online information.

Increases Productivity

A Solution Center features Honeywell's GCOS8 software that ranges from personal productivity and decision support tools to business-specific solutions. So now your end users can build their own spreadsheets, forecast trends with color graphics, browse through online files, and create or revise reports.

Think of how that could increase their productivity as well as their satisfaction. And, by freeing the MIS staff to do more of the significant tasks they were hired to perform, a Solution Center can increase the productivity of your data processing department, too.

Improves Data Management

A Solution Center improves data management by providing consistent information to end users and by eliminating unnecessary application development. It can facilitate the introduction of personal computers. And, best of all, you can tailor it to meet your specific needs.

With a Solution Center, end users get the information

With a Solution Center, end users get the information they need and you get the control you demand. It's bound to make them a lot happier, and you a lot happier too. For more information on how a Solution Center can

For more information on how a Solution Center can work for you, call toll free at 800-328-5111, extension 2724. In Minnesota, call collect 1-612-870-2142, extension 2724.

Another Big Idea From Honeywell Large Systems

Look to Honeywell Large Systems for solutions to information management problems and for products ranging from powerful computers to comprehensive networking capabilities.

Together, we can find the answers.

Honeywell

First user tries automation system as remote monitor

WILMINGTON, Mass. - A factory automation software package in its premier installation at Dynamics Research Corp. (DRC) here is being used for long-range production planning at a plant that is not owned by DRC and is not even located in the state of Massachusetts.

Such are the mysteries of the world of contract compli-

ance monitoring.
DRC is using the software, the TEC System from TEC Computer Systems, Inc. of Newton, Mass., as part of its contract with the federal government to assist the monitored plant with production planning for a product the plant is making under its own federal contract. DRC management systems section

manager Jeff Harris refused to identify the plant or the product it is making for the government, other than to say that the product is a "very sophisticated instru-ment" that must meet a manufacturing schedule of one unit produced every 18 months.

DRC's TEC System cost roughly \$80,000 and pro-

vides inventory control, bill of materials automation, production scheduling and material requirements planning functions, he said.

The software, he explained, provides long-range production planning infor-mation to the monitored plant, based on data provided to DRC by the plant's management.

Unlike most manufacturing automation programs. though, DRC's system not operate on-line with a shop floor to track inventory and to schedule production supplies.

Instead, Harris said, the monitored plant provides production data to DRC via regular uploads from its Datapoint Corp. 1560 micro-computer to DRC's Honeywell, Inc. mainframe. At DRC, the data is taken from the mainframe and input to the TEC System software, running on a Digital Equip-ment Corp. VAX-11/780.

The plant also provides written reports to DRC, which Harris said are "timely, not to the minute . . . but sufficient" for long-range planning.

The TEC System software, in turn, can warn of impending production difficulties a looming shortage of raw materials, for example — that could cause the plant to miss a production deadline. When such hitches appear likely, Harris said, DRC tries to be tactful in telling the monitored factory. "Obvious-ly, we kind of sit in an outsider's role," he said. "We're not trying to blow whistles; we're just trying to help the government and the [manufacturing] company get the iob done

One of the best features of the software, Harris said, is its ability to incorporate the plant's existing system for tracking parts salvaged from those "sophisticated instru-ments" that fail a quality control test and are cannibal-The salvaged-parts tracking feature was customized to the software by TEC Computer Systems, Harris "This is one of the reasons we chose TEC; they un-derstand our problems," he

Harris added that he was also impressed with the TEC documentation, which included a full set of function manuals, its Help functions and the fact that the software lets users "walk through a [logic] tree of screens to get what [they]

The only difficulty that DRC has experienced so far with the TEC System, Harris added, is that it is running on a minicomputer that is already supporting 35 terminals and a host of demands from other users. Delays have sometimes resulted, he noted, but that is really not a problem, since the software's job is long-range planning.
DRC initially looked at the

manufacturing automation products of more than 50 vendors before narrowing the field to 10 and requesting demonstrations.

Now You Can Put The Power Of A Desk-Top Computer In One Hand.

It weighs just 16 pounds. It measures a mere 15" x 18" x 31/2" with built-in handle and carrying case. It's truly IBM® PC compatible. And it can take your business places it's never been. Introducing Commuter.10

Featuring a 16-bit 8088 processor and the MS-DOS™ operating system, Commuter can handle anything a desk-top computer can. With 128K of memory, expandable to 512K. Single or dual floppy disk drives that each store 360K of information. And a large 80 column by 16 line optional flat panel display. Because it's truly IBM PC compatible, it can run virtually all software written for the IBM PC without modification. Including business programs like Lotus® 1-2-3,™ VisiCalc,™ and WordStar.™ And its built-in expansion ports can handle printers, hard disk, communications, and external monitors. Even the IBM PC expansion chassis

In fact, Commuter gives you the same power and capabilities as a desk-top computer. Or so-called portables weighing twice as much. Including one exceptionally powerful feature: You can pick one up starting at only \$1995.

Visual Computer Incorporated

Data Access Systems, Inc. sells, leases and services to the corporate user from a multimillion dollar inventory of PC's, CRT's, printers and modems. Its nationwide service locations give you same day on-site service. And with an extremely large leasing base, DASI will tailor a financial package to meet any budget.

Visual Computer and DASI ... An Industry Leader for 15 Years. For more information and a Commuter demonstration, call Data Access Systems, Inc. today:

Commuter. It can take your business places it's never been.





Call Us Today.

800-257-7748

In New Jersey 800-232-6510



Coles Rd. & Camden Ave. . Blackwood, NJ 08012

District Offices: Atlanta (404) 998-2255 ● Boston (617) 769-6420 ● Chicago (312) 967-0440 ● Cincinnati (513) 793-4430 Cleveland (216) 473-2131 ● Denver (303) 337-4103 ● Detroit (313) 978-7309 ● Houston (713) 682-5965 ● Los Angeles (213) 532-2238 Minneapolis (612) 854-4466 ● New Jersey (201) 227-8880 ● New York City (212) 564-9301 ● Philadelphia (609) 228-6660 Phoenix (602) 273-6989 ● San Francisco (415) 872-1811 ■ Seattle (206) 575-1448 ● Washington, DC (301) 459-3377.



AUSTRALIA

MELBOURNE — A large order, calling for an IBM 3084 system, six IBM 4361 mainframes and over 80 IBM 3180 terminals, will effectively double the computing power of National Mutual Trust and Guarantee Life Co. here. The equipment will be used to extend financial services in the bank's network of processors in mainland cities, with Tasmania hooked to Victoria by communica-tions lines, according to a company spokesman

SYDNEY - The Australian Industry Development Corp. (AIDC) has earmarked \$419,000 to establish a software publishing house to foster and coordinate the development and promotion of Unix operating system software in Australia and abroad. An existing company, Fawnray Pty. Ltd., which specializes in Unix-based applications, will be the focus of AIDC's efforts, with AIDC assuming a 47% interest in that company, sources said.

BRAZIL

RIO DE JANEIRO - Financially troubled Cobra, the government-controlled Brazilian computer maker, still lacks the money and technology needed for the development of largescale computer systems here. This is in spite of the recent appointment of Fernando Azevedo as president of the ailing firm and despite the influx of funds from the government's Na-tional Bank for Social and Economic Development, sources reported. The company may issue stock to raise additional money. At the same time, the company's board of directors is reportedly discussing other financial options, such as purchasing existing technology from Japan's Fujitsu Ltd., NEC Corp. or Hitachi Ltd. Technology from two U.S. firms, AT&T and

Amsterdam site of security meet

AMSTERDAM - The 1984 International Computer Security Congress is slated to take place here Sept. 17-

The conference is intended for computer professionals involved in implementing, specifying or authorizing security procedures for the protection of physical assets and computer data, according to confer-ence sponsor Riant Consultants, a Dutch organization specializing in computer security and training. Riant said the conference will feature security experts from around the world

Registration for the conference starts at \$600, with group discounts available.

Additional information is available from the Reservation Center through P.O. Box 3387, 1001 AD Amsterdam, Netherlands.

Digital Equipment Corp., is also un- to form desired characters. der consideration.

HONG KONG

HONG KONG - The IBM 5550 microcomputer has finally made its debut here as a Chinese-language small business and personal computer, according to the vendor. Based on the Intel Corp. 8088 chip, the 5550 is the first IBM system to incorporate both hardware and software specifically designed to process information in Chinese, according to IBM World Trade Corp. Manager Joseph Mo-vizzo. He said the 5550 keyboard only has 61 character keys because the system incorporates the Cheong Kit input method. Cheong Kit is based on the radical elements of a character It combines those elements

SINGAPORE

SINGAPORE - SAS Institute, Inc. a U.S. firm that claims to have more than 15,000 computer software packages installed in some 52 countries. established a satellite office here. The expansion was reportedly timed to coincide with the availability of the SAS System on Digital Equipment Corp. and Data General Corp. minicomputers. According to a SAS spokesman, there are over 400 SAS installations in Asia alone, assisting industrial, commercial, academic and government computer us-ers with SAS data analysis and reporting applications.

SINGAPORE — The Public Utility

Board here will boast the first Asian installation of software from Walker Interactive Products, Inc. of the U.S. The software will be used for the utility board's \$860,000 materials management information system. At the same time, the board has become user of Cullinet Software, Inc.'s IDMS data base management system.

WEST GERMANY

MUNICH - The West German computer maker Beta Systems is having problems finding the necessary funds to acquire the bankrupt Victor Technology Corp. The takeover is be-ing watched by Victor's director, Juergen Tepper, who said, "We don't feel under pressure. . . . We will take our good time to choose a reasonable



CONDOR on-line programming that reaches new heights in productivity

To get the most from your IBM mainframe, you need CONDOR – a reliable, easy-to-use, high-performance system that soars above the rest through improved programmer productivity and low resource consumption. CONDOR's highly efficient processing methods and I/O facility improve system response time and can substantially expand the capacity of your CPU while minimizing

You can write and edit programs with CONDOR and submit them for compile or execution. You can view and modify data from input and output queues, release or cancel jobs, and spool output to local and remote printers.

CONDOR's built-in library management system automatically reorganizes as you process for optimum conservation of disk space. In addition to offering stringent security against unauthorized access and supporting multiple versions, it provides detailed audit reports and program cross-referencing – both batch and on-line.

Boosting productivity even more, CONDOR's own high-level interactive programming language lets you create programs and ICL in a fraction of the time required with other languages. And a powerful set of interactive utilities makes system maintenance a breeze.

CICS and the other major TP monitors to give you total flexibility, and it supports DOS/VS(E) and MVS operating systems for versatility and upgrading capab

No wonder respondents to a recent Datapro survey rated CONDOR tops in reliability, efficiency, ease of use, ease of installation, support, and realized financial savings.

So for a system that out-performs the others and gives you complete control of all your data processing, choose CONDOR. Call for a free trial. You'll be glad you made

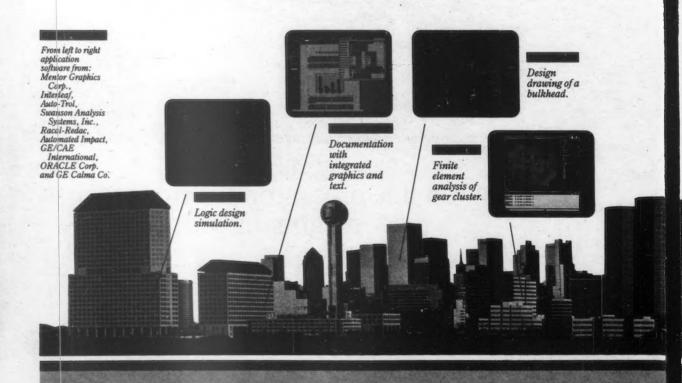
For more information contact Phoenix Computer Corporation, 11949 Jefferson Boulevard, Culver City California 90230. Toll-free (800) 255-5049 or (213) 827-4500 in California

CONDOR

We make computers that design what you make.

We're Apollo Computer, the fastest growing professional workstation company in the world. And for some very good reasons.

We introduced a new standard in the computer industry. In 1980, we introduced the next step in the evolution of the computer. With the logical successor to timesharing: DOMAIN° processing. DOMAIN processing puts on the desk of every technical professional exactly what they need to design and develop new products. Dedicated 32-bit workstations with the compute power of a mainframe. Closely-integrated, bit-mapped graphics. And a high speed local area network that shares information and resources. The result is a fully integrated, dynamic environment that lets your technical professionals produce better, more innovative new products in considerably less time. With considerably lower development costs.



We have a family of compatible workstations.

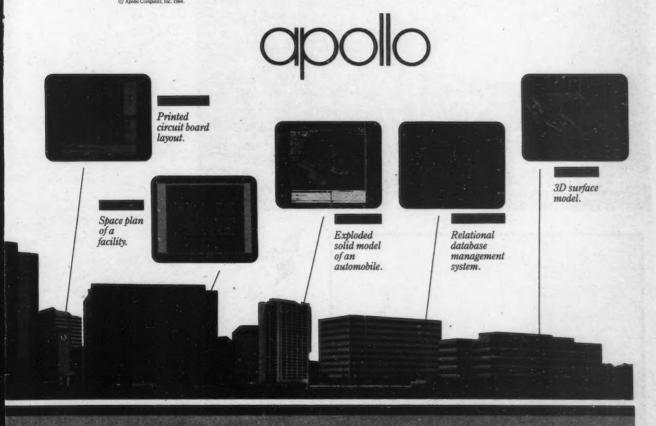
Today, we have an unprecedented range of DOMAIN workstations to meet whatever design and development needs you may have. From our high performance VAX™ 780-class DN660 (color) and DN460 (monochromatic) for applications like finite element analysis and solids modeling, to our midrange DN550 for applications like integrated circuit and printed circuit board design. To our low cost DN300 series for applications like software engineering and technical illustration. And all of our DOMAIN family of workstations are completely compatible.

We have nearly 300 technical applications packages.

To stay competitive today, you have to look beyond automating individual tasks. So we allow you to automate the entire development process. With nearly 300 of the most powerful and prestigious third party applications packages available today.

If you'd like to know how we can help boost your technical professionals' productivity and shorten your product development cycle, you have only to ask. Write or call Marketing Communications, Department A1, Apollo Computer, 330 Billerica Road, Chelmsford, Massachusetts 01824 (617) 256-6600 Ext. 4497.

DOMAIN® is a registered trademark of Apollo Computer. VAX™ is a trademark of Digital Equipment Corp. ORACLE® is a registered trademark of ORACLE Corp. ⑤ Apollo Computer, Inc. 1984.



Computer firms tapping pool of programming talent

Disabled: Incapacitated by illness, injury or wounds - Webster's Ninth New Collegiate Dictionary.

"So a person is disabled; that doesn't say his mind is gone. There are a lot of people who are disabled but still have a good, working mind."

— Joe Erney, Control Data Institute course monitor who has been suffering from rheumatoid arthritis since

MINNEAPOLIS - Employers are turning in increasing numbers to a hitherto neglected pool of programming talent — the handicapped — as more and more disabled people attempt to enter the work force.

Joan Orke discovered at age nine that she had progressive arthritis. By the time she was in her early 20s. she was crippled to the point of hav

ing to give up her job and apartment in Minneapolis and move back home with her parents, 90 miles away. There, she spent two years in bed, unable to perform even the smallest chores. For the next couple of years, able to get about only on crutches or in a wheelchair, Orke lived Orke on Social Security disability

benefits. Depressed and bored, she called the Minnesota State Depart-ment of Vocational Rehabilitation and pleaded with them to find something she could do.

"People want to be positive, contributing members of society. Being out of that throws them into despera-

tion," Orke said. The rehabilitation agency suggested that she apply for Control Data Corp.'s Homework program. At first, Orke was frightened. She knew nothing about computers and was totally intimidated by them. A Homework instructor came to her house to interview her

and demonstrate CDC's Programmed Logic for Automatic Teaching Operations (Plato) computerbased instructional system.

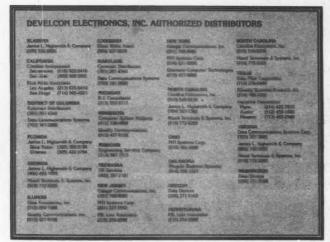
Plato system helps because it is so user-friendly," Orke said. She could communicate with other students on-line, and CDC supplied games to play to help demystify the computer.

In eight months of instruction, Orke studied a series of introductory courses (to Plato, the Homework program and computer math), in addition to the rudiments of Basic and Cobol and a brief on-line course in analysis and design.

Sent out 200 resumes

After completing the course, Orke sent out 200 resumes, briefly explaining her situation and training. A few responses came from people who said they did not hire entry-level pro-







con Electronics Inc. 744 Nina Way
Warminster, PA 18974
Telephone: (215) 443-5450
Toll Free: (800) 528-8423
RCA Telex: 275-194

Develcon Electronics Ltd. 856-51st Street East Saskatoon, Sask., Canada S7K5C7 Telephone: (306) 933-3300 Telex: 074-2686



Retraining plan grows at CDC

Control Data Corp. has been involved in a computer-based educa-tion program called Homework since 1978 Started as an effort to retrain injured employees at CDC, the program has grown into a three-phase training project for disabled people nationwide. CDC found that the direct cost

disabled people nationwide.

CDC found that the direct cost of maintaining employees on medical leaves of absence — assuming disability extends to age 65—costs from 14 to 30 times more than providing disabled employees with a good education in programming, depending upon the age at which disability occurs.

The CDC project is carried out in conjunction with state agencies nationwide that make referrals to the program and supply funding. CDC provides Programmed Logic for Automatic Teaching, Operations (Plato), a computer-based instructional system that uses plasma display terminals hooked up to a mainframe in CDC's Minneapolis office to teach business application programming languages.

Phase One is an evaluation of the potential student's motivation and suitability. The students' disabilities include blindness, deafness, mobility impairment and para- and quadraplegia. The student must be highly motivated, as he must work alone at home for up to two years to complete training. Only those potential students who

to two years to complete training.
Only those potential students who prove their aptitude for programming are accepted.

Phase Two is the delivery of at-

Phase Two is the delivery of at-home training. Instructors visit students occasionally, but most training is done on-line. Placement is the third phase of

the program. Special Homework counselors work independently or with a state agency to find a buyer for the new programmer's services. In addition to tax breaks sometimes realized by hiring disabled people, the employer knows he is getting a fully trained, reliable explorer.

able employee.
Information on the Homework program is available from Ralph McCrae, manager, CDC Homework Marketing, P.O. Box 0, Minneapolis, Minn. 55440.

while giving handicapped new outlook on work, life

grammers, but would be interested after she had some experience. However, there were no interview offers. At the same time, CDC was con-

At the same time, CDC was contacting large companies for placement possibilities, and out of their efforts she received two interviews.

Orke was hired as an associate programmer by Honeywell, Inc. in Minneapolis. In the beginning, she worked at home, going into the office one afternoon a week for staff meetings. She now spends three afternoons a week in the office, because she feels that she is missing a lot by not being there. "Working at home, you don't get to know the other staff members. A lot of informal learning goes on when you work with other

people," Orke said.

Orke's supervisors at Honeywell empathize with her problems and are trying to help her overcome some of them. Orke is now in the process of documenting those problems to establish a protocol for handling them. One difficulty is that Orke does not have an interactive terminal and cannot communicate with her co-workers while she is home. If she is stuck, it can often take two to three hours to reach people for solutions. "I don't feel that any of these problems are insurmountable. If there's a solution, we'll find it," Orke said.

Excitement spills over when Orke talks about her life. She moved back to Minneapolis, has her own apartment and a car and is close to having all her medical bills paid off. She just had her first vacation in five years and is happily planning a trip to Mexico in the winter. Orke spoke of a "marvelous change" in her life since she has become trained and employed, and she feels much better physically and emotionally. In May, she was promoted to programmer.

Asked about her chances for adsorbancement, Orke said the division head that she works for at Honeywell is absolutely sure her chances are as good as anybody else's, but nevertheless she has some reservations. The natural progression is from associate programmer to programmer to programmer/analyst, and the program-

mer/analyst position involves a great deal of interaction with users. One of the characteristics that makes arthritis difficult to live with is fatigue, and Orke wonders how she could deal with users while extremely fatigued. As for her contribution to the com-

As for her contribution to the company, Orke said, "I have a really good production rate. I'm not distracted by the noise and lighting of a busy office, so I can concentrate. I think home programmers are always more productive." Orke is particulary interested in helping Honeywell expand its involvement with home workers. "People who have been out of work are much more grateful for their jobs, more apt to work hard," she said.

IBM programs fund training for disabled

The precursor of IBM's Project With Industry program for the severely physically disabled who started in 1972 with the suggestion of a then recently disabled employee: Experience gained from first efforts and from a federally funded survey conducted by IBM identified a need for a continuing training program.

The goal of IBM's effort is to establish self-sestaining and locally operated projects to select, train and assist disabled people in becoming gainfully employed. IBM

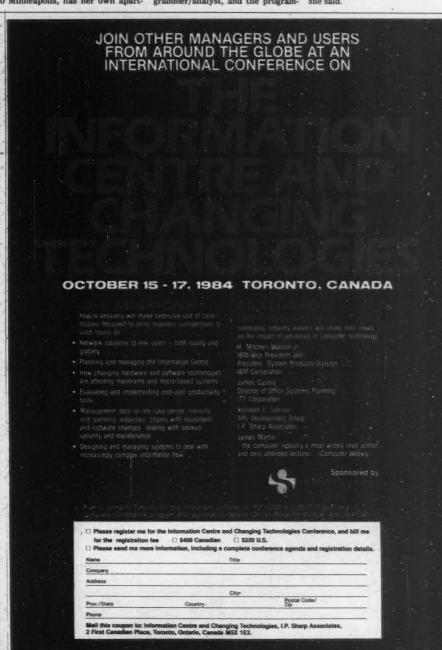
Local business advisory councils in each targeted area establish a curriculum to meet local business needs.

serves, in an advisory capacity, state vocational rehabilitation agencies that select candidates for the nine-month program. Applicants are closen based on above-average intelligence and results from various aptitude tests that are determined by the involved agencies.

Local business advisory councils in each targeted area establish a corriculum to meet local business needs. Job placement opportunities for the trainess develop through local agencies and the business advisory councils.

At this time, there are 25 active BM computer programmer training projects throughout the U.S. Over 80% of those completing the course have been placed in self-sustaining jobs, totalling more than 1,000 placements.

More information on the program is available from IBM's Federal Systems Division; which is located at 6600 Rockledge Drive Bethesda Md 20817.



SDC program trains visually impaired

System Development Corp. (SDC), a Burroughs Corp. subsidiary that provides software design and development for both the aerospace industry and the government, has for 18 years run a program that has produced more than 200 entry-

Earl Sheffield manages the eightmonth-long Visually Handicapped Programmer Training course, which covers an introduction to program-ming and programming in Cobol and

The State of California's Department of Rehabilitation locates and recommends blind or visually impaired candidates.SDC pays for the class facilities, computer time and instructors, and the Department of Rehabilitation subsidizes housing

Standardized testing must show that the prospective trainee has an IQ of 115 or better and a very high ability to do logical reasoning. The Rehabilitation Department also must guarantee that the candidate is independent, that is, able to travel back and forth to classes on his

Blind students use tape record-

ers, Maryland Computer Services, Inc.'s talking terminals and Perkins Braillers (a typewriter-like device invented approximately 50 years ago) to take notes. Telecentury Systems, Inc.'s Optacon hand-held electronic scanner reads printed material and outputs a matrix of pins that students feel with their fingertips to identify letters. This device reads hard copy and, with an adapter,

Information on the program can be obtained from Earl Sheffield, SDC, 2500 Colorado Ave., Santa Monica, Calif. 90406.

JAN aids firms hiring disabled employees

Employers in business and industry are increasingly willing to hire from a great untapped pool of workers — disabled people — but because of lost production or the high costs of maintaining an out-of-work employee, the disability often belongs to the company. Respectively a private secretar employers often belongs to the company. Responding to private-sector employers' questions of how to modify work spaces to enable the hiring of special needs employees, the President's Committee on Employment of the Handicapped (PCEH), the National Institute of Handicapped Research and the Rehabilitation Services Administration instituted the Job Accommodation Network (JAN) this past May.

JAN collects information about special accommodations in a computerized data base that is used to find practical solutions to adaptation problems. To date, the data base contains more than 1,700 accommodation information entries that include job modifications, as-

commodation information entries that include job modifications, assistive devices, scheduling changes and work place adaptations. PCEH projects that, by the end of this year, there will be 3,000 entries. JAN will be fully op-

3,000 entries. JAN will be fully operational this month.

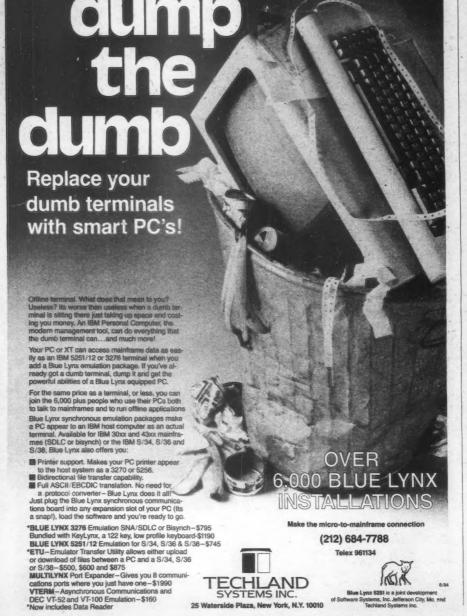
Any business willing to share its job accommodation experience with JAN may use JAN's resources free of charge. The employer must arswer a few questions designed to identify precisely the acceptable limitations of disabled job applicants, what kinds of adaptations are needed and job requirements.

An abstract of suggested solutions to the employer's problem is available and is either mailed or electronically transmitted to the employer. Included in this information are the names and phone

mation are the names and phone numbers of employers who have agreed to share similar job experiences and the cost of such arrangements. (Solutions can be as simple as office furniture rearrangem or as complicated as the acquisi-tion of sophisticated equipment.) Contributors to JAN's data base

include ITT, AT&T, Prudential Insurance Co., Honeywell, Inc. and the National Restaurant Associa-

The Job Accommodation Network for employers is operational now at its national toll-free num-ber: 1-800-JAN-PCEH.



ECHLAND SYSTEMS INC. 25 Waterside Plaza, New York, N.Y. 10010



Customized system takes care of health firm's growth

SYOSSET, N.Y. — Statistics reveal that by 1990, one out of every five people in the U.S. will be age 70 or over. This aging trend is a major factor in the growth of this country's home health care industry.

U.S. Health Extension Services, Inc. (HES), based here, has experienced exceptional growth as a result of this trend. With consolidated after-tax earnings of 40% from 1981 to 1983, HES President Martin Weissman attributed part of his company's success to its customized computerization.

To help keep pace with the company's fast growth, HES enlisted Jerome Gilbert, president of Cornell Computer Corp., a 13-year-old firm that provides consulting services to businesses ranging from health care and pharmaceuticals to banking, retailing and government agencies.

Customized software

In 1979, Gilbert advised Weissman to computerize, and Gilbert selected the IBM System/34, operating under RPG II, as the system to use. The key to the system's capabilities and productivity is Cornell's customized software developed for the home health care industry. Under this system, information is transmitted via facsimile machines to HES' Long Island, N.Y., headquarters from outlying operating offices.

The headquarters office houses 16 CRT terminals and two high-speed printers that handle the 5,000 bills sent to third-party payees each week and that create 5,000 weekly paychecks for nurses and paramedic personnel.

The customized system requires one input to create the various checks, namely, a time record that is transmitted from each of the offices via facsimile. The system also generates management reports that show gross profit per case per week, sales, payroll and a work sheet created for each HES office. The work sheet lists each professional operating from that office, its past billings and the pay rate for each employee.

Due to HES' growth rate, however, Gilbert recently recommended that Cornell Computer further expand the system.

The current computer is the core of a centralized system that works well with a smaller volume of paperwork. According to Weissman, "What is now required is an information system that will significantly condense paperwork and provide for smooth integration of our acquisitions and accommodate new government forms. It must be able to store and retrieve employee records and

perform accounting, inventory and number manipulation tasks as well as word processing and credit collection procedures. In addition, it has to be easily expandable."

Based on these parameters, HES decided to implement a Wang Laboratories, Inc. VS-100 distributed system that provides access

from each branch office. Local HES offices will eventually have a microcomputer to perform time slip data entry (formerly done in Syosset).

This data will then be forwarded daily or weekly, depending on volume, to the central computer here. The central unit will also be able to communicate with the desktop branch computers and can update files, employee records and governmentmandated procedures for all operating offices. Time slip and other information will be transmitted directly to the main computer from operating offices and automatically processed, bypassing the extra steps involved in manual input.

The new system will, in

addition, orchestrate a sales and rental equipment inventory for HES' medical equipment operations. Other features include automatic stock replenishment orders, cost accounting, billing, general ledger and number-crunching tasks that are necessary additions to provide management control of product movement.



Computer Interruptus

Midnight. And you wish you would be left in the dark. But miles away in the DP Department, a misplaced DD override, an invalid concatenation, or some other equally obscure JCL error brought production to a standstill.

And when the system breaks down, it's you or your staff they call up.Which usually means getting up and getting down there. And after a night like that, how productive will the morning be?

What a waste. If you had the JCLCHECK™ program, you wouldn't have JCL errors, period. None. Zilch. Zero.

Because the JCLCHECK program can catch any and all JCL errors and give you complete, on-line JCL validation and concise error diagnostics.
Plus complete documentation on a job stream or entire production system suitable for insertion in the run book.
And it can operate under TSO, TONE, ROSCOE or CMS.

Imagine, with no more ICL errors, your programmers can finally concentrate on what you hired them for writing programs.

So what are you waiting for? Send the coupon or call us at (408) 554-8121 for details. We'll show you how the ICLCHECK program can bring your error detection out of the dark ages, increase production, and eliminate applications backlog. And that'll put you in the spotlight. I'm frustrated and tired of JCL errors.

Send me details on the JCLCHECK program.

Have a representative call me.

NAME

TITLE

COMPANY

ADORESS.

CITY. STATE, ZIP

PHONE

OPERATING SYSTEM.

Triangle Software Company

4340 Stevens Creek Blvd., Suite 108 San Jose, CA 95129

© Copyright Triangle Software Company, JCLCHECK is a trademark of Triangle Software Company

When You Need Computer Equipment Moved!

Rely On Experts

- · One-Day Pick-up and Delivery
- Competitive Rates
- Specially Equipped Radio Dispatched Trucks
- · Air Freight Handling
- Warehouse Facilities
- · Full Insurance Coverage

Serving Southern California Since 1970

For more details. call toll-free:

(800) 821-5270 U.S. except Calif.

(800) 521-5537

California



2914 E. 46th Street, Los Angeles, CA 90058

NEWS

Package helps food outlet spice up its on-line, batch operations

GRAND RAPIDS, Mich. - Spartan Stores, Inc. is the twelfth largest food wholesaler in the U.S. In attaining that rank, Spartan ran into problems developing and maintaining systems to support both its own growth and that of its client stores.

Spartan, based here, is "owned" by its 470 member stores across Michigan, Indiana and Ohio. It provides automated warehousing of grocery items plus support services for its retail outlets.

The DP department at Spartan is a rapidly growing Cobol shop that consists of about 110 people. Much of the work done here supports the corporation in the usual ways (payroll, accounts payable), but the DP shop also develops applications for any of its stores that want services. Within this department, there are five application development groups, each with a leader and between seven and 11 an-

alysts and programmers.

Two IBM mainframes, a 4341 and a 3083, which now run on the DOS/ CICS operating system, form the heart of Spartan's data center. Fred Van Assen, senior systems analyst, said that the machines will be converted to IBM's MVS operating system in the near future to increase their power.

With 1,500 to 2,000 jobs processed in the center each week, and with one computer devoted to development all day, every day, Spartan's manage-ment saw the need to speed up devel-opment and maintenance of both online and batch applications systems, Van Assen said.

With a shopping list of needs, Van Assen and Paul Glasier, senior pro-grammer, looked at 105 offerings from several companies. After studying each product carefully, the two decided that the Umbrella System from Hogan Systems, Inc. met most of

their requirements.

'We were looking for six types of tools - a data dictionary, system design aids, project management, document generation, batch and on-line code generation and report writing," Glasier said. "Of these six, Umbrella consolidated all but project manage-ment and system design into one

The ability to use Umbrella for either batch or on-line work was also a deciding factor. Umbrella encourages modular program design, which makes program changes and enhancements quicker and easier, Glasier said.

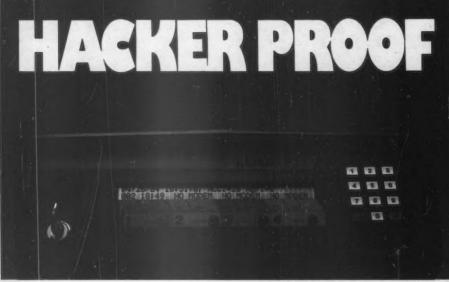
Hogan suggested a pilot project to st the system. That project started in March 1983, and six months later, Spartan reevaluated the system's merits. "We took a look at what we had learned," Glasier explained.

"During that time, we used Umbrella to develop an application management and planning system." At the end of the test phase, Van Assen and Glasier had experienced few problems during project development and recommended that Spartan purchase Umbrella.

A problem that arose after installation was the staff's resistance to changing the way they operated. To alleviate that, training classes took place both at Hogan Systems and at Spartan, and some of Spartan's programmers and users continue to train others in-house. According to Van Assen, the training has been about 90% successful.

Van Assen estimated that Spartan is experiencing a 50% to 100% time savings in maintenance and as much as a 20% savings in the development stages.

"Both our retailers and our end users here at Spartan will benefit be-cause the data processing department will be more able to respond to their needs," Van Assen said.



Have SECURE dial access to ANY computer using NO passwords and NO dialback with DATA LOCK & KEY™

Simply connect a DATA LOCK (shown above) between your mainframe and your modems. Is-sue the portable **DATA KEYS** (shown below) to all authorized personnel. Only these members of your staff can access



from any telephone-and they need no passwords! They simply dial in, and are connected.

NO PASSWORDS?

Only a DATA KEY can provide correct responses to the large random numbers sent by the DATA LOCK. Thus the LOCK

quickly identifies authorized users, and allows them to access the mainframe. Because the numbers are random, the dialogue between LOCK and KEY is different every time a user dials in.

Access is not dependent on passwords remembered, forgot ten or passed along, so it is faster and more secure

HACKERS, BEWARE.

DATA LOCK is ever-vigilant. Every unauthorized access at-tempt is immediately detected, thwarted, displayed, printed and remembered. Simultaneously, computer room personnel are alerted by a piercing alarm.

AUDITORS, REJOICE!

Just connect a printer to a DATA LOCK to obtain a comprehensive audit trail, which includes the following information:

- Date, time and details of all calls handled.
- · Statistics of line usage.
- Unauthorized DATA KEYS (i.e. lost or stolen KEYS).

SPECIFICATIONS DATA LOCK & KEY Works wi works with all computers and modems with RS232 connections. The system is compatible with async, Bisync, SNA/SDLC and all other protocols. No adjustments are necessary for protocol, baud rate, modern type; etc. Protocols and mainframes of different types can be simultaneously supported by one **DATA LOCK**. LINES SUPPORTED: DATA LOCK-DATA KEY-1

DATA KEYS supported by DATA LOCK: any number. PRICE: DATA LOCK—\$4,000 DATA KEY—\$400



Nabisco cuts messaging costs with electronic mail

PARSIPPANY, N.J. -Nabisco Brands, Inc. went from a punchedpaper tape messaging system to elec-tronic mail and saved 20% on its mes-

saging operating costs.

Nabisco replaced its Western Union, Inc. Infocom message system with an electronic mail system that has brought with it a \$14,000 monthly savings, equal to 20% of Nabisco's previous costs, and confidence that messages sent will be received, according to Nabisco's telecommunica-tions director, Walter C. Jacobs.

Nabisco's new system, Worldwide Integrated Communications (Winc) from Mohawk Data Sciences, Inc. (MDS), transmits messages faster than the previous system and, most importantly, assures the sender that the message was received, something that was lacking with the Infocom system, Jacobs explained. Nabisco replaced Infocom with the electronic mail system, Jacobs said, because "We felt there were state-of-the-art advances in message switching that

had gone beyond Infocom."
Nabisco's Winc system, used to transmit domestic and international messages and sales and shipping information, is composed of 35 MDS Series 21 distributed processing work-stations and 19 MDS Messenger terminals.

Messages are logged onto the workstations and terminals by Na bisco employees and, every 15 to 90 minutes, depending on the level of service selected, the MDS computer in Wilton, Conn., polls the terminals, sorts the messages and retransmits them to the addressee. When the addressee receives the message, a confirming notice is sent to the sender.

The Series 21 workstations can also be used for word processing and IBM 3270 terminal emulation; the Messenger terminals can communicate with Wang Laboratories, Inc. and IBM terminals, Jacobs said.

"One of the most important features of the network," added Larry Herzing, Nabisco's telecommunications project manager, "is its ability to expand to meet Nabisco's future needs. Winc was the best service for us, and the MDS terminals proved to be excellent."

By comparison, Jacobs said, the Infocom system had been based on telex terminals that had a three-row keyboard - less familiar to office workers - and produced a punchedpaper tape. As a whole, he said, the Infocom system "was a little bit awkward. It's certainly not an automated

Getting the message

Jacobs said that the biggest diffi-culty the firm experienced with Infocom was being certain that message sent were being received. Jacobs said some messages had gone astray and that employees were making followup telephone calls to those they had sent messages to in hopes of confirming the message's receipt.

But Jacobs was also quick to note that Western Union had provided the Infocom service to the firm for at least eight years and that no lost mes-sages cost the firm any "million-dollar orders." Western Union, he continued, still has a good working relationship with Nabisco, and sever-

al telex terminals are still in use by Nabisco branch offices to send me iges to branches already on the Winc system.

Nabisco began its search for a new message system with a request for proposals from a group of 40 ven-dors. The vendors, Jacobs said, were divided between those wanting Nabisco to develop its own in-house message center, a move that would require at least a minicomputer and two employees, and others who of-fered their public electronic mail services. The question became one of, 'Was there enough traffic to bring in an in-house processor?" Jacobs said. The answer, Nabisco found, was no. Instead, the firm chose Winc,

largely because of its multifunctional terminals and reliability, Jacobs said, adding that there have been no major problems with the service since its introduction.

The \$14,000 monthly savings, Jacobs said, came from Winc's reliance on Wats lines and its higher trans-mission rates. Winc, he said, transmits at 1,200 bit/sec; Infocom trans-mits at 110 bit/sec. Nabisco senior telecommunica-

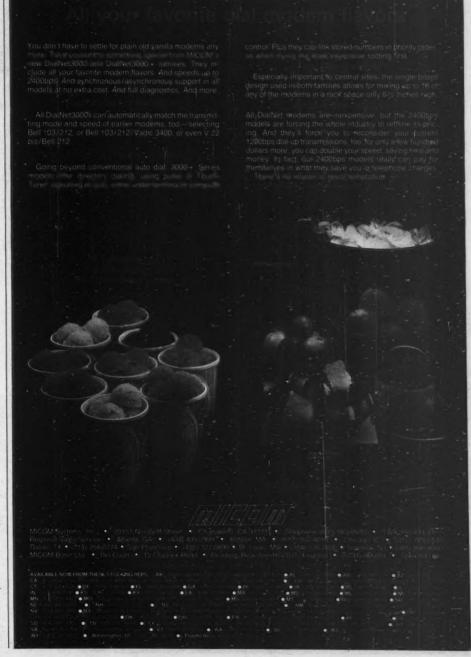
tions analyst Glenn Overman pointed

out that TWX messages can now be sent directly to the receive-only port on the Messenger terminals, and telex messages are being received via Winc terminals set up as telex gate-

On the whole, "We went through a huge technological jump" by switch-ing to Winc, Jacobs said, but "accep-

tance has been uniformly good."

The Winc system at Nabisco, he said, is an example of taking "this talk of the technological revolution" from the abstract to the concrete by telling employees, "Here's a tool that's going to help you do your job."



Program aid performs many roles for service bureau

BUFFALO, N.Y. - Datek Instacard, Inc., a service bureau here, relies on a utility program generator for every thing from report generation to file updating and the conversion of Ebcdic code to As-

Datek initially installed the utility program genera-tor, UFG from Mathis and Associates, Inc. of Coventry, R.I., in 1976 for the sole purpose of providing report gen-

The service bureau, whose primary business is serving client savings and loan asso ciations, soon found that UPG had a high degree of versatility, according to George Knorr, Datek's vicepresident of systems and programming.

The program generator has since been put to use "for all manners of applications," Knorr explained.

It has patched a software overlay onto another program, conducted file updating of an overdraft loan system and converted the data formats used at several remote data processing shops to the Datek format, and it has done so very effectively, Knorr said.

The UPG software has also lent speed to his department, Knorr said, noting that in "90% of the cases, pro-grammers can get what they are looking for in less time than it would take just to compile an [NCR Corp.] Neat/ 3 or Cobol program."

Knorr also noted that prorams written in UPG run faster than those written us-ing the Neat/3 assembler.

Besides providing speed, Knorr said. UPG has increased productivity to the point where it is "probably two to three times what it would be in our normal Neat/ 3 environment."

Datek purchased UPG over two other similar programs in 1976 and recovered its cost in three months.

Datek chose UPG, he said, for its ease of use and flexi-

bility.

The software first ran on Datek's NCR Century 251 and is now shared by that processor and the firm's NCR Criterion 85/75.

Datek has also come to appreciate the software supplier's continual enhanceme of its program, Knorr said.

He noted that Datek has paid \$150 per year in maintenance fees for the software since it was purchased, and in return, the publisher "has never let it sit long enough to get old."

Knorr said he particularly appreciated "the attention that John Mathis [the publisher] has taken to upgrade and enhance the product continually."

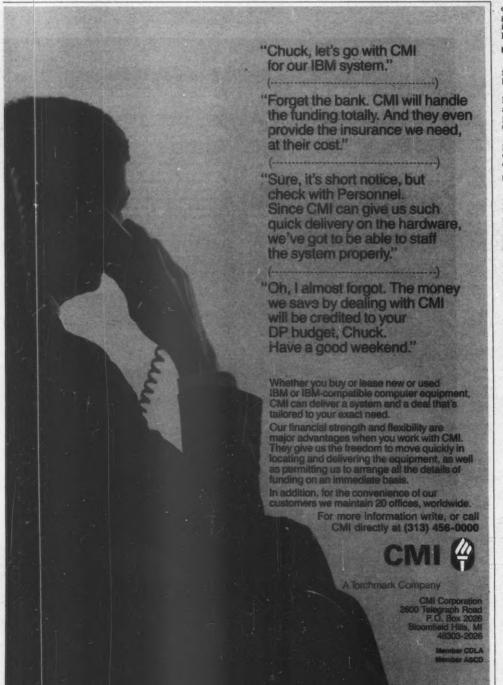
Knorr said he could recall only two hitches in the use of the software and that "both of those were to the point where you didn't need to get a patch right away" to keep the software running.

Operating system seminar set

NUTLEY, N.J. - Data-Tech Institute will present a two-day seminar that focuses on different operating systems Sept. 6-7 at the Sheraton National Hotel in Arlington, Va., and Sept. 13-14 at the Chase Park Plaza Hotel in St. Louis.

"Operating Systems: A Comparative Analysis — Mi-cros to Mainframes" will cover processor management, storage management, system networking performance. and communications, Data-Tech said.

The seminar costs \$595. Additional information about the conference is available from Data-Tech Institute at 386 Franklin Ave., Box 569, Nutley, N.J. 07110.



System beefs up program development at food chain

ROCKY MOUNT, N.C. -

Don Gladwell had a problem.
The director of systems development for Hardee's Food Systems, Inc., the third largest fast-food chain in the U.S., was trying to make command-level Cobol, oper-ating under IBM's CICS, com-municate with IBM's DMS format on Digital Equipment Corp. and IBM equipment.

Hardee's has approximately 160 terminals, and Gladwell's job was to try to make them all communicate

While he said it would take days to write a program. it would typically take weeks to convert it to CICS command-level Cobol to allow for communications. "We problems linking the two, Gladwell said.

Gladwell began shopping for a software package that would make communications easier. He evaluated a number of software products, in-cluding Oxford Software Corp.'s UFO; Multiplications, Inc.'s Accolade; and IBM's

He was in the process of evaluating all of these when he was told that Pansophic Systems, Inc. was demonstrating its Gener/OL product in Raleigh, N.C. Gladwell saw the demonstration and chose the product.

"The main reason for our choice was that no CICS expertise is required for using Gener/OL, while all of the other packages required that knowledge," Gladwell said. "With Gener/OL, everything is done within the one pack age, and there is no need to create links to CICS com-mand-level code. We didn't want to go through that link."

Gener/OL was brought up at Hardee's in October 1983. Problems relating to the environment typical of any new software conversion and Gladwell gave credit to Pansophic for being responsive.

Gener/OL has speeded the delivery of new programs at the company by up to 50%, Gladwell said, noting, "Now I can do a whole job in a few days." He added, "We feel that we will realize even greater time savings as our programmers continue to use

Gener/OL has been well accepted by the programming staff, Gladwell noted. 'We have one programmer trainee who had not written any CICS programs whatsoever. She was able to learn Gener/OL very rapidly and felt that it was very easy to " he said. use.

Gladwell added that another reason for the pur-chase of Gener/OL was the need to be able to develop screens for users. He explained that most of the data entry functions have been

placed in the user areas.

'Data is collected every night from point-of-sale devices in 880 company-owned restaurants," he said. "If we miss a store for any reason. DP will call and collect that data from the manager. This situation dictated our need for a well-formulated screen, for easy input, [and] that is fast. Gener/OL allows edits at the screen so that we have no rejects in the batch sys tem -- the data entered is all good.'

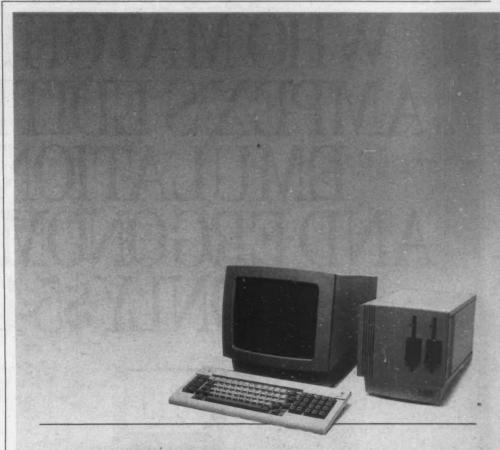
Gladwell observed that Gener/OL has helped to make Hardee's more competitive.

Hardee's Food Systems was founded in 1960 with one restaurant. In addition to its U.S. restaurants, Hardee's has restaurants in seven foreign countries and has over 32,000 employees. The firm is the food service division of Imasco U.S.A, Inc. and is wholly owned by Imasco Ltd. of Montreal.

Hardee's data processing division includes 15 people in systems development and 27 people in technical support, communications and opera-tions. The division provides

service to all financial departments, including accounts receivable, payroll/ personnel and others. It also provides services to the restaurant operations and marketing area.

The hardware includes DEC equipment along with an IBM 4331 and an IBM 4341, both under DOS/VSE with VM.



CAN YOU FIND We'll tell you where to look. Inside the CIE-7800 and CIE-7850. THE SEVEN IBMS IN THIS PICTURE? plug competible with the IBM 3178 and all five mod-

The 7800 terminal is els of the 3278 series. That

accounts for six IBMs Now, when you add in the CIE-7850. you also get 100% IBM PC compatibility. That makes seven. Even more remarkable, the CIE-7800

costs less than any single one of those IBM terminals

It's more compact, too. Over 40% smaller. But the screen is larger. By 36%. The monitor tilts and weighs less than

20 pounds. Move it where you need it. The detached keyboard has an 87-key IBM compatible layout. It can be user configured into any of 22 different U.S. and international keyboards

The CIE-7800 is also available with concurrent alternate personalities that include DEC VT100.® IBM 3275/3276-2 (bisynch single station) and HP 2622, while still retaining IBM 3178/3278 compatibility.

And with the CIE-7850 plugged into the coax-A line, you have access to both online mainframe processing power and local IBM PC intelligence.

To learn more (and there are more

advantages we haven't even touched on), just write or call our Distributed Systems Division Sales Representative: Alternate Channel Marketing, Inc., Suite 540, 3857 Birch Street, Newport Beach, CA 92660. Call toll-free 1-800-854-5959. In California, call 1-800-432-3687



ON THE NEXT MPEX'S EDIT FOR ONLY \$

That's right. No one. Not TeleVideo, not ADDS, not

Lear Siegler.R

Not surprising. Because the Ampex 210 isn't just a conversational terminal at a stripped-down price.

It's loaded.

With editing and other features you'd expect only on more expensive terminals.

With 14 popular, non-volatile emulations you can switch at the touch of a key.

And with ergonomics like a low-profile, Selectric-type^R keyboard for easy typing. A large 14" tilt-and-swivel screen for easy reading. And amber or green at no extra cost. How can we sell all that for \$549.

or even less in quantity? Then back everything with nationwide service and a full six-month warranty? By taking advantage of

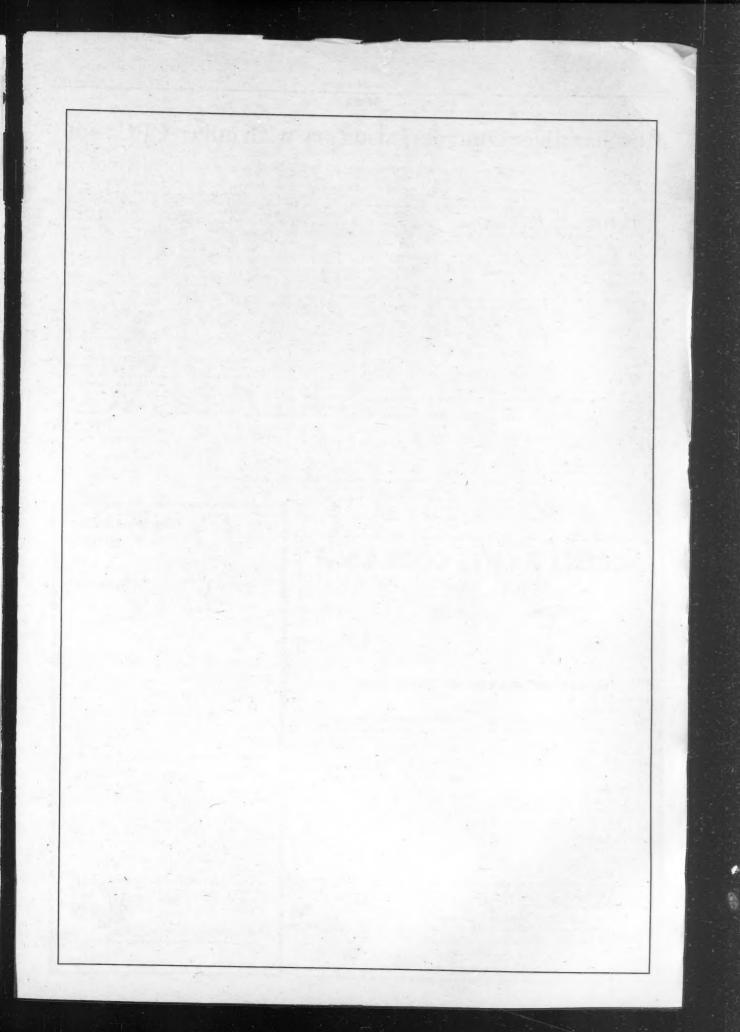
something none of our competitors can match—our 30 years of video, computer peripheral and manufacturing expertise.

So call Ampex Computer Products Division

toll free at 800 621-0292. 800 821-9473 in California. Ask us to detail everything we pack into our \$549 terminal.

Then go out and compare us to the competition. But don't be surprised if you can't AMPEX
find any.

Ampex Corporation • One of The Signal Companies



Merchandiser controls inventory with micro-CPU tool

RIVERSIDE, Calif. — Performing miracles is how Retail Merchandising Service Automation, Inc. (RSMA) describes its newest micromainframe software package, which is helping 400 apparel retailers, doing \$3.25 billion worth of business annually, control inventories.

However, in this instance, it is spelled "Miracls," the acronym for Micro Inventory Reporting and Control System, which 100 RMSA field managers are using to help computerize merchandise and inventory control planning

The backbone of the system is a communications unit with accompanying software that attaches to the host mainframe's — an IBM 360/30 — communications channel instead of transferring data through the front end of the mainframe. This unit and a proprietary software package allow store managers to obtain inventory feedback on sales from the RMSA host, which is directly connected to in-store IBM Personal Computer XT micros.

700,000 tickets

Until recently, RMSA was manually processing some 700,000 garment tickets a month, which retail stores collected when a piece of apparel was sold and which were then sent to the company.

Every piece of merchandise could be recorded and analyzed, enabling RMSA to make accurate recommendations' about markdowns, reorders and store-to-store merchandise transfers.

Even though the system worked well, the processing of the ticket stubs was time-consuming, despite the introduction of bar codes on the stubs, which helped the apparel stores transmit sales information to the RMSA host computer.

However, there was one major obstacle. Neither RMSA's IBM 1403 nor 3211 line printers had the graphics capability to print bar codes for the stores. IBM's 3800 laser printer did have that capability, but RMSA did not want to spend \$350,000 plus monthly usage charges to use it.

"Since we generate 700,000 garment tickets a month, the usage charges alone would have been murder," commented Steven Brown, RMSA's director of

systems programming.

Lower cost dot matrix printers with graphics capabilities were available for printing bar codes, but, according to Brown, there was no cost-effective way to get the data from the host computer to the printers.

Hydra II

Then RMSA heard of Hydra II, a protocol converter distributed by Diversified Data Resources, Inc. of San Rafael, Calif. that could turn an asynchronous dot matrix printer into a local 1403 or 3211 printer. "This meant we weren't locked into an expensive laser printer," Brown said.

RMSA purchased a 16-port Hydra II and several Printronix, Inc. P600 printers to print bar codes for the apparel customers. The Hydra II is manufactured by JDS Microprocessing of Mission Viejo, Calif.

The Hydra II provides a similar interface with RS-232C printers to emulate local 3211, 1403, 3286, or 3287 printers. A general-purpose interface enables communications with RS-232C devices via a high-level protocol to transmit the data from the

personal computer to the host.

Transmitting bar-coded garment tickets to the stores in some fashion other than express mail was the next step in RMSA's evolving service. It decided to send the information to the store, where an on-site printer could produce the bar code on the ticket.

Knowing that its customers were willing to invest in their own micros to aid in the inventory and sales control of their merchandise was a key to the evolution of Miracls. Brown said.

Data files could be transmitted directly to the customer's micro disk storage using a terminal emulator, since it "takes advantage of the async port and requires no additional hardware," Brown said. This meant there was no need for a protocol converter at the micro site.

'Lower overall cost'

"It has built-in, full-error checking and transfer of files into the asynchronous protocol, providing the reliability of a synchronous protocol at a lower overall cost," Brown added.

The emulator, also distributed by Diversified Data, has no file transfer capability. It allows an IBM Personal Computer XT to emulate a 3277, 3278 or a 3279 when attached to the Hydra II protocol converter. No protocol converter is required for the emulator to allow a Personal Computer XT to emulate a Digital Equipment Corp. VT52 or VT100.

The emulator and accompanying software is produced by Computer Vectors, Inc., also of Mission Viejo.

Since the implementation of the Miracls system, the transmission of processed ticket data to the customer is accomplished at the rate of 1F9 tickets per minute.

1F9 tickets per minute. Picket printing on-site is accomplished at approximately 10 to 15 tickets per minute. Reports back to the host and to the micro are sent at approximately 200 pages per minute.

RMSA provides its customers with 11 different reports on sales data generated by its Miracls system.

ACCENT R CUTS CODE 80%!





More power for your DEC-10/20, VAX*

CUT CODE

ACCENT R can cut your code up to 80%. ACCENT R's 4th generation language incorporates a unique concept that models the various data processing components. These models result in 80% less code than required by FORTRAN or COBOL.

SAVE TIME

Less code means less programming and debugging time. But that's not the only way ACCENT R can save you time. ACCENT R's powerful non-procedural language provides a complete range of commands so end users can easily add, change and delete data items.

CUT COSTS

Naturally if you save time, you save money. Programmers produce more applications in less time. End users generate their own reports and put less demand on the data processing professionals. And both programmers and end users are happier. Satisfied employees means less turnover.

SAVE YOUR SANITY

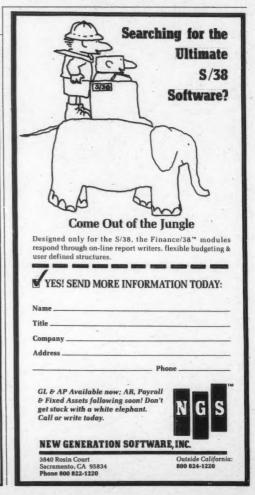
If you are using a DEC 10 or 20 now but see a VAX in your future, rest easy. ACCENT R is migratable software. DEC 10/20 today, VAX tomorrow. A syntactically identical version makes migration easy; special pre-release pricing makes it affordable.

'VAX version available late 1984.

For more information send to: 20370 Town Ctr. Lane, #130, Cupertino, CA 95014 408/257-7700



Company Address		i je	
			-





DAVID A: BROWNING has been promoted to manager of computer planning/telecommunications at Conoco, Inc., and MORRIS L. HELBACH will be promoted to replace Browning as manager of computer planning and user services for the company, a computer and telecommunications services firm in Ponca City, Okla.

Browning has been associated with Conoco since 1963. He became director of computer and telecommunications services in 1979 and was promoted to manager of computer planning and user services last year.

services last year.

He graduated from Southwest Missouri State University with a B.S. in mathematics.

Helbach started with Conoco in Ponca City and worked there from 1970 to 1981. He worked briefly with an affiliated company in London and transferred to Houston as director of systems development in 1982.

He graduated with a B.S. in personnel from Oklahoma State University.

JOSEPH M. O'DONNELL, vice-president and information group manager for Conrac Corp. of Stamford, Conn., has been given responsibility for operations at Conrac's Alston Division in Duarte, Calif.

In addition to his new assignment, O'Donnell, who joined Conrac in March, will continue to manage the company's two domestic information display divisions.

Prior to Joining Conrac, he was general manager of the Keyboard Division of ITT. Before that, he worked in the telecommunications and data communications department of General Instrument Corp.

He holds a B.S. in business and an MBA, both from the University of Tennessee.



WAYNE CATLETT has joined Atalla Corp. of San Jose, Calif., as director of secure telecommunications technology. He will lead a design team responsible for developing security products for personal computers. Applications for the products include home banking, corporate cash management, financial services, videotex, electronic mail, wire transfer and information services.

Prior to joining Atalla, Catlett was a partner in Xypher Security Systems of Minneapolis, where he developed devices for high-speed data encryption.

Atalla, in business since 1972, creates, manufactures and markets systems for secure electronic banking and data communications services.

JOSEPH J. COLLINS has been promoted to senior vicepresident of corporate administration for Jefferson Ward in Miami. Jefferson Ward is a 44-store subsidiary of Montgomery Ward. Collins is responsible for managment information systems, distribution, telecommunications as well as corporate services.

Prior to his new assignment, Collins was vice-president of MIS, a position he held since joining Jefferson Ward in 1982.

Collins' association with retailing began in 1967, when he worked at Sears, Roebuck & Co., while attending the University of Miami.

After receiving his B.A. in psychology in 1972, Collins joined Jordan Marsh Co., Miami, and held positions in distribution and accounting. He subsequently advanced to director of selling systems.

director of selling systems.
In 1978, Collins became
manager of store systems at
Carter Hawley Hale Stores,
Inc. of Los Angeles and two
years later was named director of MIS at Fed Mart in San
Diego, the position he held
until joining Jefferson Ward.





CALENDAR

WEEK OF SEPT. 9

SEPTEMBER 10-11, BOSTON — Fourth-Generation
Data Management Software Institute of America, 8 Windsor
St., Andover, Mass. 01810.
SEPTEMBER 10-11.

SEPTEMBER 10-11, WASHINGTON, D.C. — DBS IV. Contact: Seminar Registration, Phillips Publishing, Inc., Suite 1200N, 7315 Wisconsin Ave., Bethesda, Md. 20814.

SEPTEMBER 10-11,
HASBROUCK HEIGHTS,
N.J. — Supporting and
Maintaining the Data Communications Network. Contact: Data-Tech Institute, 386
Franklin Ave., Nutley, N.J.
07110.

SEPTEMBER 10-12, TO-RONTO — The Second International Congress & Exhibition on Computer Security. Contact: International Security Congress, 160 Duncan Mill Road, Don Mills, Ont., Canada M3B 125.

SEPTEMBER 10-12, NEW YORK — IMS Utilities. Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

SEPTEMBER 10-14, MIN-NEAPOLIS — Structured Programming Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER
NEW YORK — MVS JCL.
Contact: Sysed, Inc., One
Park Ave., New York, N.Y.

SEPTEMBER 10-14, PARIS — The Sixth International Congress of Cybernetics and Systems of the World Organization of General Systems and Cyberneties. Contact: Association Francaise pour la Cybernetique Economique et Technique, 156 Blvd. Pereire-F. 75017; Paris, France.

SEPTEMBER 10-14, BOS-TON — Structured Analysis and System Specification Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Sept.

10-14 in Houston.
SEPTEMBER
10-14,
WASHINGTON, D.C. — Operating Systems for Microcomputers. Contact: George
Washington University, Continuing Engineering Education,
Washington, D.C.

SEPTEMBER 10-14, AN-AHEIM, CALIF. — Structured Design for Real-Time Systems. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 10-14, NEW YORK — Data Base Development Workshop. Contact: Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop

W., Houston, Texas 77092. shop. Contact: You SEPTEMBER 10-14, 1133 Ave. of the

SEPTEMBER 10-14, PHOENIX — Project Planning and Control Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 10-14, HOUSTON — MVS/SP & XA. Contact: Computer Systems Research, Inc., 40 Darling Drive, Avon, Conn. 06001.

SEPTEMBER 10-14, CLEVELAND — Structured Analysis and Design Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 10-14, AT-LANTA — Structured Design Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 11-12, DALLAS — Integrating the Mainframe and the Micro in the * Corporate Environment. Contact: Institute for Advanced Computing Technology, Suite 108, 1433 Santa

Monica Blvd., Santa Monica, Calif. 90404.

SEPTEMBER 11-13, DALLAS — Midcon/84 High-Technology Electronics Exhibition and Convention. Contact: Electronic Conventions, Inc., 8110 Airport Blvd., Los Angeles, Calif. 90045.

SEPTEMBER 11-13, DALLAS — Data Base Administration and Data Resource Development. Contact: Software Institute of America, 8 Windsor St., An-

dover, Mass. 01810.

SEPTEMBER 11-13, BOSTON — Electronic Imaging 1984. Contact: Electronic Imaging 1984, Morgan-Grampian Expositions Group, Two Park Ave., New York, N.Y. 10016.

SEPTEMBER 11-13, AR-LINGTON, VA. — Voice Input/Output Systems Applications Conference 1984. Contact: Association of Voice Input/Output Systems, P.O. Box 60904; Palo Alto, Calif. 94306.



SEPTEMBER 11-13, DALLAS — Mini/Micro Midwest-84 Computer Conference and Exhibition. Contact: Electronic Conventions, Inc., 8110 Airport Blvd., Los Angeles, Calif. 90045.

SEPTEMBER 11-14, LOS ANGELES — Unix Systems Expo/84. Contact: Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159. SEPTEMBER 11-14,

SEPTEMBER 11-14, WASHINGTON, D.C. — Distributed Processing: Mini

11-13, and Microcomputer Implementations. Contact: Ruth Dordick, Integrated Computbition. er Systems, P.O. Box 45404, 6305 Arizona Place, Los An-Airport geles, Calif. 90045. Also being held Sept. 25-28 in Boston.

SEPTEMBER 11-14, WASHINGTON, D.C. — Data Communications. Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Sept.

25-28 in San Diego.

SEPTEMBER 11-14, LOS ANGELES — Designing Real-Time Systems: A Hands-On Workshop. Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Sept. 25-28 in Washington, D.C.

25-28 in Washington, D.C.
SEPTEMBER 11-14,
WASHINGTON, D.C. — Designing with 16-Bit Micros.
Contact: Ruth Dordick, Integrated Computer Systems,

P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. Also being held Sept. 18-21 in Los Angeles and Sept. 25-28 in Long Island, N.Y.

WEEK OF SEPT. 16

SEPTEMBER 18-19, WASHINGTON, D.C. — Mortgage Banking Automation Workshop and Computer Expo. Contact: Director of Registrations, Mortgage Bankers Association of America, 1125 15th St. N.W.,

Washington, D.C. 20005. SEPTEMBER 18-21, SAN DIEGO — Implementing Lecal-Area Networks. Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Sept. 25-28 in Washington, D.C.

SEPTEMBER 18-22, JA-KARTA, INDONESIA —
Business Indonesia — The
International Business and
Office Equipment Exhibition. Contact: Elizabeth Sillars, Overseas Exhibition
Services, 11 Manchester
Square, London W1M 5AB

SEPTEMBER 19-20, UNIONDALE, N.Y. — Dbase II. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Sept. 24-25 in Los Angeles and Washington, D.C.

SEPTEMBER 19-20, NEW YORK — The Association of Field Service Managers (AFSM) Future Trends in Service of Electronic Products Seminar. Contact: Thomas M. Ross, AFSM, Suite B, 6237 Presidential Court, Fort Myers, Fla. 33907.

SEPTEMBER 19-21,
PHILADELPHIA — Networking & Data Communications for Personal Computers. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Sept. 24-26 in Costa Mesa, Calif.

SEPTEMBER 19-21, WASHINGTON, D.C. — Systems Analysis and Design: Concepts and Effective Practice. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

SEPTEMBER 19-21, ST.
LOUIS — Introduction to
Vsam for OS/VS System
Programmers. Contact: Center for the Study of Data Processing, Campus Box 1141,
Washington University, St.

Louis, Mo. 63130.
SEPTEMBER 19-21,
CALGARY, ALBERTA —
Network Communications
Protocols. Contact: Center
for Advanced Professional
Education, Suite 110, 1820 E.
Garry St., Santa Ana, Calif.
92705.

SEPTEMBER 19-21, SAN FRANCISCO — Unix. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

SEPTEMBER 20-21, WASHINGTON, D.C. — IMS/VS DB/DC Concepts. Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040

SEPTEMBER 20-21, CHI-CAGO — Data Communications: Advanced Concepts, Products and Services. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Herbie Briggs has just destroyed the myth that all floppy discs are created equal.

They seem equal. Until you look at the seams.

That's where equality ends.

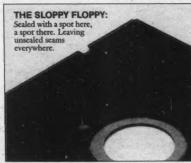
Most companies seal their discs with a spot here, a spot there. Leaving most of each seam not sealed at all.

Sooner or later, the seams might do what comes naturally: they bulge. Warp. Pucker.

Pens, pencils, fingernails—even a fouryear-old's, like Herbie—can catch and snag in those wide open spaces.

That's sloppy. And dangerous. Because if you put a sloppy floppy into your disc drive, it can jam your drive. Ruin your drive head. Lose your data.

So much for their seams. Ours are different.



Memorex uses a process we developed, called Solid-Seam Bonding.

Solid-Seam Bonding seals shut every inch of every seam of every Memorex*floppy disc. Tight as a drum. That makes the Memorex floppy stiffer. Stronger. And your data safer. To resist bulging, warping, puckering, or opening up.



To resist all the things that can jam your drive, ruin your drive head, or lose your data.

Which proves that a Memorex floppy disc isn't equal to all the others. It's better.

Solid-Seam Bonding is just one example of the extra care that goes into every Memorex floppy disc. Be it 8," 54" or the new 3½." Extra care that lets us guarantee every Memorex disc to be 100% error-free.

The next time you're buying a floppy disc—or a few hundred of them—just remember this:

It's always better to be safe than sloppy. For more information on the full line of Memorex quality computer media products, including computer tape, call toll-free: 800-222-1150. In Alaska and Hawaii call collect: 408-987-2961.

Your Data. When it matters, make it Memorex."

MEMOREX A Burroughs Company

Memorex is a registered tradema of Memorex Corporation. °1984 Memorex Corporation

ORIA

What's to stop IBM now?

Two important and undeniable forces prevailed in the recent settlement of differences between IBM and the European Economic Community: the sobering economic realities of Western Europe and the awesome market power of IBM, power that has now defied the leveling efforts of the strongest governments in the free world.

Taken together, those forces produced the only plausible result of the EEC's lengthy investigation of alleged antitrust behavior on the Continent. And that result, while preserving the EEC's integrity, will do virtually nothing to limit IBM's ability to dominate Western Europe, more effectively, perhaps, than the company dominates the U.S. market.

Consider first the economic realities. Word Western Europe, as recently as late spring, was that the EEC was preparing some tough sanctions geared to curb IBM's de facto market rule. Further rumblings from the EEC in Brussels suggested that efforts to compromise had largely failed, that IBM was an unmovable object in the path of a more competitive market.

The company's response was simple and direct. John Opel, IBM chairman, in a speech in London in May, suggested that IBM always had the option of taking its multi-billion-dollar Western European investment elsewhere should the business climate there turn inclement

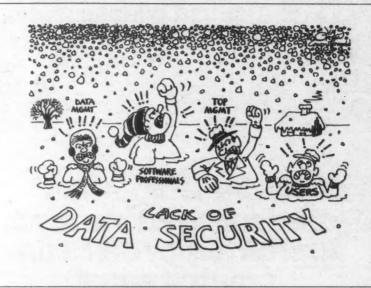
The EEC had to consider three ramifications of Opel's statement: 1) IBM employs nearly 100,000 people in 25 plants and re-search centers in the 10 EEC member countries; 2) IBM's European facilities churn out \$11 billion-plus worth of annual output mostly for European consumption; 3) Western Europe's recovery from the most recent recession is painfully slow. The EEC decision reflects its choice of political and economic concerns over matters of antitrust. It is also noteworthy that the most vociferous plaintiffs in the EEC matter were two U.S. companies, one of which — Amdahl Corp. — is half owned by Japanese interests.

The other undeniable force, IBM's market power, was best illustrated by the final terms of agreement.

Essentially, IBM relinquished very little and is now much freer to assume greater control than it previously had of a geographic market that has more potential growth than even the U.S. market. As it is now, IBM garners nearly 10 times the revenues of its closest European competitor, CII-Honeywell Bull of France.

In particular, the early disclosure of technical information to which IBM agreed will deviate a couple of months, at most, from the accelerated schedule of disclosure now followed. given the rapid pace of technological change in the mainframe business. Besides, IBM can announce new products whenever it chooses, maintaining an option to hold back an announcement a month or two longer than it would in the absence of a disclosure agreement. Being as dominant in the marketplace as it is, IBM will suffer little, if at all, in doing so, especially if it means protecting its competi-

It all adds up very positively for IBM. The specter of antitrust litigation has been struck down in the U.S. and Europe - markets representing 75% of IBM's business — and will not very likely be raised again for some time. Whether this bodes well or ill for the rest of the computing community is hardly moot. If the governments of the Western World can't argue, who can?



But nobody does anything about it.

LETTER

Civil bankruptcy vs. criminal case

The article "Mob flexing computer muscle to streamline operations" [CW, July 23] left the mental equivalent of a bad taste in my mouth. There is no valid comparison of a civil bankruptcy hearing and a criminal case.

The framers of the Constitution may not have anticipated electronic data bases, but they had plenty of experience with bad laws. To put it simply: If a lawyer cannot convince a jury of intelligent laymen that a crime has been committed, then

that case is not ready for trial.

The article might be read to imply that our law enforcement system needs other interesting innovations to equip properly it for witch-hunts: no-knock warrants for data base searches, for one, and (apparently) some well-armed Feds to gun down the hapless operator who is standing at the console when they come to call. (After all, how else

can investigators capture a data base that is rigged to self-destruct at the touch of a button?) If it's all the same to you, I'd rather take my chances with the Mob.

Kevin Martin Ramsey, N.J.

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or less; they may be edited for the purposes of clarity and brevity.

Letters should be addressed to Editor, Computerworld, Box 880, 875 Cochituate Road, Framingham,

COMPLETERWINE D

John C. Whitmarsh	Executive Editor Rita Shoor	Managing Editor Bill Laberis	Assistant Managing Editor Donovan White
Senior Editora: Software Paul Gillin Communications John Dix Phil Histor Phil Histor Phil Histor Display Tom Honkel Microcomputers Eric Bender Industry Peter Bartolik Features George Harrar Design Editor Marjoric Magowan International Editor Susan Bildeney	Staff Writers: James Connolly John Desmond Paul Korzeniowski Maura McChanery Devid Offmoe Donna Ramondi Edward Wamer Correspondents: New York Sulte 7G 401 East 80th St. New York, N.Y. 10021 21/25/70-21:50 Senior Correspondent: Byan Wilkins Correspondent: Byan Wilkins	Correspondents: Kathleen Button Kathleen Sullivan 1080 Marsh Rd. Menlo Park, Calif. 94025 415/328-9064 Chelef Copy Editor Kathle Gow Assistant Chief Copy Editors: Goopy Editors: Becky Batcha Bruca Crane Deborah Fickling Patricia Heal Penny, Janzen	Contributors Education J. Daniel Couger Human Connection Jack Stone Turneround Time Larly Lording Microcomputation The Data Center John P. Murray Lacht on Beisnes Charles P. Lecht Special Publications Computerworld Extral George Harrar, Editor
Associate Features Editor Barbara Van Scoyoc Assistant Features Editor	445 National Press . Building 529 14th St., N.W.,	Joseph Stalvey Lory Zottola Assistant to the Editor June Fettio	Computerworld on Communications Bruce Hoard, Editor Computerworld OA
Elizabeth Morse Senior Writer John Gallant	Washington, D.C. 20045 202/347-6718 West Coast Bureau Chief: Jeffry Beeler	Editorial Assistants: Lorraine Brien Mary DeCristoforo	Ann Dooley, Editor Computerworld Buyer's Guides

Main Editorial Office: Box 880, 375 Cochituate Road, Framingham, MA 01701 617/879-0700

Computerworks a member of the CM Communications/inc. group, the world's largues publisher of computer-veilated information. The group publishers 55 computer publications in 24 major countries. Nine million people read one or more of this group's publications each month, Nembers of the group include. Agreemint is Computererick/Agreemints Assistants. The Assist Computerwork Australia's Computerwork/Australia's Australia. Australia Australia Australia Computerwork Busist in Bulletine and Melica Computerwork Australia (*Polici and Describers: Busist in Bulletine and Melica Computerwork Australia (*Polici and Describers: Busist in Bulletine and Melica Computerwork (*Polici and Describers: Busist in Bulletine and Melica Computerwork). Also computerwork (*Polici Agreeming Computerwork). Also computerwork (*Polici Agreeming Computerwork).

'Road Warrior' rides again



What a relief! After 50 years of dealing with pencils, I've laid mine to rest in favor of my word processing personal computer to aid me in my race against each deadline. I "crashed" after seeing the Australian film, Road Warrior; it provided me with an image of myself as a word processing operator with which I could deal. My newly acquired

machine was dubbed "Trans-Am.

I wouldn't have abandoned pencils even if it had been possible to do so in my earliest years which it wasn't) since I, like other babies, go kind of pleasure chewing pencils that a keyboard could never give. And in my school years, I ouldn't hear of using a keyboard — then found only on a typewriter — to bang out whatever; I was convinced that the medium pandered to teachers too lazy to decipher earnest handwriting attempts and sapped destined-to-stardom writers like myself of their creativity as they were caused to yield to the typewriter's electromechanical production demands. These, in their heyday, were enough to give the least fastidious writer a nervous breakdown as he torturously dealt with erasures, cross-outs and fingerprints while creating black cavities and white mounds — if not holes on otherwise flat paper; the horror of retyping the whole thing was enough to make a person choose instead to do hard labor on a rock pile. That may be why, until word processors came along, so many secretaries killed their bosses.

Like the slide rule that was never made by an

engineer, the typewriter was never made by a writer (although you'd have thought so by the

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies

likes of the flattering image society has thus far sy of the day; changes are easily entered without conferred on its user). And like the slide rule, whose fate it was to be suddenly and utterly dis-carded — not even phased-out gracefully as was the horse and buggy — the typewriter is being rapidly abandoned as people realize that word processors correct most of its more onerous deficiencies while increasing its powers.

Like the slide rule, whose fate it was to be suddenly and utterly discarded, the typewriter is being rapidly abandoned as people realize that word processors correct most of its more onerous deficiencies while increasing its powers.

Word processors will finally put the overvalued typewriter in its (rightful) place — that of the Gutenberg press. Owners of these were never mistak riters, so the problem of writer identification will be cleared up. Taking the typewriter's place in our lives, that is, the lives of people who used them at all (which doesn't include me), or the pencil's place for antitypewriter folks (which does), the word processor has made even old holdouts like me fall victim to its productive charm.

Keying into a mistake-forgiving word processor provides incredible r-e-l-i-e-f to the mistake-prone typist; he can now put to paper the message he wants rather than the one that he didn't want to erase. Kids are now freed from being judged on the neatness of their typewritten work; whatever their typing skill, the finished product can always be made to look flawless. No longer need secretaries worry about retyping the boss' creative whim-

crewing up the previous stuff. And talk about clean copy!

As you may have concluded. I am ecstatic over the fact that I gave up my pencil and started using a word processor. Before this event, I was forced to communicate my wishes on what to do with my manuscripts to a series of typists who themselves had taken the big step of abandoning the contrap-tions to which they owed their livelihoods for many years. Smug in the knowlege that I hated typewriters and secure that I would never sit do-ing what I am doing now, they had me by the tail, if you know what I mean.

"He'll never key anything," they reasoned. America's executives will all get their own coffee first - I had others do both for me for 25 years and got spoiled. Besides, I was known to be against "milking machines" of any type. On a visit to merry old England some years ago, I heard a dairy farmer talk of his disdain for milking machines; this was based upon his sworn witness, after using these machines, to a reduction in the cream con tent of his herd's milk. He attributed this to bovine depression induced by a cow's loss of its master's touch and the loss of occasions of intimacy like those involving an occasional slurp of his neck with her tongue. While admittedly a bit hard to swallow, it's not difficult to sympathize with the spirit of the farmer's message as it pertains to us: compare the words whispered to a person we love with those issued to a machine (however we may love it). If they are the same, we're deep in the proverbial stuff known best by farmers out standing in their fields.

So, dear readers, until the last few essays in this newspaper, I wrote everything I published by hand, using the instrument I had grown to know so well - my trusty pencil - if I wrote at all, that is.

That all this led my friends to conclude that I'd never actually enter my own work on a keyboard is understandable. Some knew that I had better things to do with my fingers than keying while See ROAD page 54

The answer to confiscation of traveling portables



HUMAN CONNECTION Jack Stone

Fit to be tied, I was. And you would be too if you were halfway out the door headed for Mexico, psyched to perform possibly the greatest single field test of a computer since "Land ho" validated the abacus. There I was, all set to prove the efficacy, utility and performance functionality of the kneetop computer (formerly known as the lap or notebook computer) in the torrid, subtropical jungles of the Yucatan, when my confidant from the Mexican Tourism Council sadly related that there was no way my Teleram Computer Corp. portable — designer's case and all — would make it past the sharp-eyed customs agents.

You might wonder why I didn't obtain some sort of import license to bring my little beauty across the border. Good question, that. My confidant had also told me earlier that it takes about six months to obtain one from the Mexican government "if you're lucky," and even with the license, there was no ironbound guarantee that some teenage soldier outfitted with a tommy gun, glittering eyes and flypaper hands wouldn't be attracted to it. Even with my silver-tongued oratory, I'm not altogether certain that I would want to debate the issue with him, at least not while his hands were fondling the trigger.

Calling all the intellectual and experiential reources that I could muster, I quickly concluded that without a machine, my test program would be rather limited. I already sensed the embarassment from imagining the letters to the editor of the "Annals of the Association for Computing Machinery," which would note the discrepancy in what was otherwise to be exquisite research on a critically important topic.

The one alternative

There was but one alternative. I had purchased a computer toy for my teenager, Adam, who is currently in process of, literally, clearing rocks away from his pathways to success. You see, while in his first year of college, through a part-time job, he serendipitously found his life's career: cutting grass. He is currently thinking about taking a few years off to plan the International Lawn Management Corp., and if it's successful, he'll skip college altogether.

Now, don't believe that I'm not proud of him, but in an attempt to encourage him toward other pursuits, such as the computer industry, I bought him a Radio Shack Corp. TRS-100 kneetop, replete with the new half-size cassette recorder and hand-some black carrying case. With this background, my strategy for obtaining a machine was clear. I was merely going to borrow it from the kid while he was out communing with nature. He'd never miss it, I figured, as I was certain it was laying in a remote corner of his room, swamped by mud-

streaked equipment and numerous journals, magazines and books for grass-cutting freaks, with roaches, bugs and worms mucking all about. Which it was, they were and I did.

Now I'm not too much for the 100's functional capabilities or those of its competitors, like the NEC Corp. and Epson America, Inc. older notebooks, mainly because their word processing capabilities are a cut below the minimum I deem nec sary to operate productively. For example, in the TRS, text entry is always done with the insert mode, which cannot be suppressed; the result is that no overstriking is possible, and you must delete all unwanted text! Further, you are forever scrolling back and forth to check out text since there are only eight lines showing.

Also, the product provides the world's simplest but least capable — "data management" system. You can select records from string input, even finding uppercase fields from lowercase (wingy, dingy!). But that's all, and I mean ALL, No sort, no column rearrange, no global replace, no nuttin'. (Ergo, toy for the kid.)

Now if you are a perfect typist, have only small documents to prepare and are into telecommunications, the TRS-100 is just the portable machine for you. Or if you need a low-profile machine (read "miniscule coefficiency of confiscation") for a historic field test where tiny size and trivial weight are far more important than functionality, then the 100 is the right choice. Well, I did, and it was.

So I hauled the 100 and recorder out from their case, hid them amidst my shirts in my large suitcase and flew off to Cancun, Mexico. To be contin-

Stone is an independent management consultant, educator and writer, specializing in DP hu-man communications and personnel development, based in Washington, D.C.

THE AT&T FAMILY OF DATASPEED

WORD WORD

You need hardworking, multi-functional terminals dedicated to improving productivity.

AT&T Information Systems can help. We have a full line of asynchronous and synchronous data terminal products that enable you to move and manage information quickly. Products designed to get the word around.

Our DATASPEED 4000 Terminals are engineered to get along well with people, too.

Non-glare, high-resolution, black background tilt screens, English language options, and light-weight detachable keyboards in typewriter format keep users comfortable and productive.

Features like windowing, split-screen mode,

80- or 132-column wide-screen format, and non-volatile PF keys help reduce user errors.

Conversational and editing terminals that speak for themselves.

The DATASPEED 4410, 4415, 4420 and 4430 Terminals are asynchronous desk-top workstations with superior features and functionality.

The 4410 is conversational, with graphics and sophisticated display capabilities.

If you need an editing display terminal, the 4415 is one of the most functional in its class. The 4420 is a feature-rich editing display terminal. It's especially engineered to help the nontechnical

user become proficient quickly.

The 4430 is a conversational terminal for the multi-point, private line environment. There's no need for the computer to poll and address these multi-point terminals. This saves you valuable processing time.

Synchronous terminals on speaking terms with IBM.

AT&T Information Systems' DATASPEED 4540, Enhanced 4540 and 4540 Touch Screen Terminals are designed for a clustered, polled environment. All of these synchronous terminals are compact, modular and 3270 compatible.





The 4540 and Touch Screen 4540 support SDLC/BSC line protocols. With one of our new controllers, you can upgrade to SNA by simply changing a diskette.

For SNA/SDLC compatability, there's the

For SNA/SDLC compatability, there's the Enhanced 4540. It offers flexibility, introducing a choice of two controllers, standard- or reduced-sized displays and high- or low-profile keyboards.

The Touch Screen 4540 has 30 touch-sensitive areas on the screen which give you fast, easy access to information.

A history of communicating better.

AT&T led the communications revolution over

100 years ago. Our products and service set the standards for performance and reliability.

standards for performance and reliability.

Today, 4,000 scientists from Bell Laboratories are working full time to develop and design new business products at AT&T Information Systems Laboratories. Products we continue to support by the largest, most experienced sales and service force in the industry.

force in the industry.

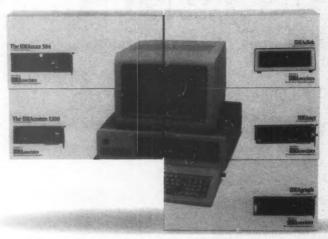
Our family of DATASPEED Terminals incorporate Information Systems Architecture, the design principle that integrates our products so they perform as one system. As you grow, the flexibility of Information Systems Architecture allows for easy system expansion.

To learn how our family of DATASPEED Terminals can increase your profits and productivity, call 1-800-247-1212, Ext. 329.

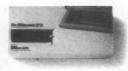
WHEN YOU'VE GOT TO BE RIGHT.



We have a missing piece for your IBM PC.



Forget IRMA. Here's IDEAcomm 3278. The best idea in mainframe communications.



If you're shopping for PC-to-mainframe communications, you'll want to know how the IDEAcomm 3278 stacks up against IRMA.

IRMA has a reputation for being fast. But the IDEAcomm 3278's powerful file transfer moves data faster. Up to 60% faster.* Response time is nearly instantaneous.

Plus, our file transfer is real file transfer. You can spool files from the mainframe to the PC and back again by hitting just one key. One key to send a file, one key to receive a file. Try that with IRMA.

IRMA also has a reputation for being flexible. IDEAcomm 3278 is more flexible. You can specify how to change the 3278's programmable keys to best suit your applications. And our 3279 emulation mode lets you configure colors any way you want. It's up to you. With IRMA, IRMA decides.

The IDEAcomm 3278 also makes life easier for your data processing department. Included in our reference manual is a programmers' section which outlines how to automate functions which previously had to be performed manually.

Other features include:

 100% compatible with Micro Tempus and Paramin mainframe link packages. IDEAcomm 3278 interfaces to IBM 3274 and 3276 controllers.

Includes TSO and VM/CMS file transfer.

 File transfer sends all text files to the mainframe. HEX files can be sent to the host, then spooled to other users.

Best of all, IDEAcomm 3278 costs less. Only \$995 complete. Including software. There are no hidden charges.

Ask for IDEAcomm 3278 and the entire IDEA family of products at all Computer Depot, Math Box, Amerisource, and Northeast Computer stores, plus selected Computerland, Inacomp, and MicroAge® locations. For the name of the IDEA store nearest you, call us at 800-257-5027.

See why the best IDEA in mainframe communications is the piece you've been missing for your PC.

*In benchmark studies, IDEAcomm 3278 transmission speed on a local mode 3274 was up to 60% faster than IRMA.



IBM and the IBM logo are registered trademarks of International Business Machines Corporation. MicroAge and IRMA are registered trademarks of MicroAge Computer Stores and Digital Communications Associates, Inc., respectively. IDEAcomm 3278 is a registered trademark of IDEAssociates, Inc.



Unrealistic views

Jack Stone's "DP aspirants with unrealistic expectations" [CW, July 9] hit several responsive chords here. I am a professor of computer science at a four-year college that has had an undergraduate computer science major for 18 years. It has been the expe rience of our department that our job has gotten harder since we started getting freshmen with high school computer experience. We have found that students without such a background are generally the better students by the end of the first semes-

The reason for this is the poor quality of high school instruction in computer science, which is a result of the unrealistic view toward computer science of many administrators and teachers. It has been my experience that administrators expect teachers can be "converted" into computer scientists by giving them a course in Basic, frequently taught by someone whose background is not much stronger than their own. And many teachers, not knowing better, find no problem with this attitude

I am afraid that computer education has become just another educational fad and that little will be done to see that it is done right. The result will be that many students will be turned off to computer science, just as many were turned off to mathematics by the educational system's poor implementation of "new math" two decades ago. Even now, students are coming out of high school thinking that computer science consists of "language collecting" and do not expect the rigor and emphasis on problem solving they discover in college. Computer science is hard. Our

schools must stop teaching that it is not. Only then will there be hope of ending the unrealistic expectations of the general public.

Michael P. Conlon Potsdam, N.Y.

Garbage lives forever

"Service bureau: slap in the face?" [CW, July 9] merely illustrates a here-tofore unnamed law of absurdity, namely: The life expectancy of a system is inversely proportional to its quality. Restated: Garbage lives for-

I've seen this law at work many, many times, with and without service bureaus in sight.

Reno, Nev.

Video game advantage?

With regard to "College tries computer camp for girls only" [CW, June 25], I can only hope that Dr. Markita Price was misquoted in the statement "... the popularity of video games among junior high school boys gives them the edge when it comes to learning how to run computer systems.

Video games are popular among junior high students and do not afford those who use them an advantage when learning to run real computer systems. Computer camp for girls only might be a fine idea, but not because they have limited experience with video games.

anne Kellogg, Hamilton, N.Y.

Footnoting response time

Since we have been investigating the advantages of subsecond re-sponse time for the past 18 months, I'd like to add a footnote to Lawrence J. Kosmatka's "A user challenges val-ue of subsecond response time" [CW,

Like Kosmatka, we have con-firmed the existence of "Thadhani's curve" and share his skepticism, although for a different reason. Our measurements indicate that when system response time gets down to a small enough value - somewhere

around .25 second - the dependent and independent variables reverse

In this way, we can explain our observation, at 900 transactions per hour, of the highly unusual internal system response time of .05 second.

In short, our measurements sug gest that interpretation of the Thad-hani curve is valid for internal response times down to approximately .25 second, but that increased transaction rates are of dubious interpretation below that point.

fichael L. Coleman Pittsburgh, Pa.

Advertising copy?

Even though a little late, I must respond to the In Depth "Turnaround management" [CW, April 9]. Al-though some of Joseph Izzo's comments regarding poor data processing departments certainly have a great deal of truth in them, I felt that the article amounted to well-written advertising copy for Izzo's company.

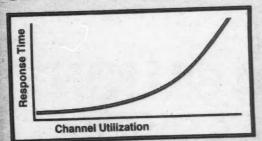
In cases of poorly run depart-ments, if a competent DP manager can be brought in and given the top management commitment required and discussed by Izzo, a dramatic be accomplished turnaround can without the requirement for any ex-ternal consultant's involvement.

Many of the advantages attributed by Izzo to his company's "turnaround management" could be refuted on a point-by-point basis. I am surprised that Computerworld would run a piece that so closely resembles a management-oriented proposal to hire the services of the author's company.
Richard K. Fox

Bear, Del.

The Gual News

PDSMAN/XP Improves Performance and Auditability of MVS Libraries



Dynamic BLDL and PFO Improve Performance

The dynamic BLDL facility of PDSMAN/XP improves performance by maintaining in main storage the directory entries of recently accessed library members. PDSMAN/XP then satisfies the majority of BLDL requests (some customers tell us up to 98% of the requests) from main storage. Since a majority of the BLDL requests can be satisfied from main storage, the time spent accessing and searching library directories is reduced. This reduced accessing also reduces both channel activity and the time a device is "busy." Reports are also provided that and in identifying highly ac-

cessed members, and show exactly how installation libraries are being accessed.

PDSMAN/XP's Program Fetch Optimization (PFO) facility provides further performance improvements by bypassing the searching of JOBLIB and STEPLIB library directories when the requested member is resident in storage or has an active entry in the dynamic BLDL table maintained for the system linklist.

dynamic BLDL table main-tained for the system linklist.
The climination of un-necessary library directory searching provides significant performance benefits in both online and batch environ-ments. How is your response time today?

Audit Trails improve Auditability

How many times has a production program abended and you couldn't pinpoint who updated it last or when it was last updated? Perhaps you were also unsure of whether any of the source components had changed in the intervening PDSMAN/XP transport.

period.

PDSMAN/XP increases the manageability of libraries by providing audit trail time-stamps for all types of libraries. Some of the information provided by PDSMAN/XP's audit reports includes:

- Member version control information.
- Library update activity, such as deletions, addi-tions, and replacements.
- 3. Source members that comprise a load module.
- COPY members compris-ing a module at the time of compilation.

Audit trail timestamps. Use-ful reports that supply precise version and update informa-tion for library members.

PDSMAN/XP also provides complete space reuse, purge control and library productiv-



Goal

Systems Goal Systems International Inc

5455 N. High Street Columbus, Ohio 43214-1193 Phone (614) 888-1775

For more information about a FREE TRIAL, call Goal Systems toll-free today at 800-848-4640

Manufacturing systems: justifying the investment



READER'S PLATFORM
Daniel J. Sitler

The March Special Report [CW, March 26] would tempt anyone into opting for more flexible manufacturing systems. Every manufacturer would like to get the most out of his hourly wage and capital investment dollars. However, the unfamiliar and costly nature of integrating numerical control machinery, robotics and automated material transport systems makes such investment difficult to justify.

One of the major concerns in creat-

ing flexible manufacturing systems is the cost of the computer hardware

and software required to complex operations. For example, the cost of programming a robot to pick a workpiece from a bin and properly orient the piece for machining is very high when the pieces are put in the bin at random. This cost could be considerably reduced by using measurable containers, similar to egg cartons, to hold the pieces.

Programming a series of incremental movements, rather than a blind search and grab, would involve far fewer conditions for the programmer to take into account.

Another concern when producing great numbers of parts in complete

automation is the possibility of producing a large quantity of parts out of tolerance. Modern numerical control systems often include adaptive control, so when a bad part is caught by the gauging mechanism, the machine tool control is corrected to produce the next part within tolerance. However, if the correction

is too wide, it is possible that one part will be too big, the next too small, the next too big and so on. The purchaser of an adapative control system should be sure that such an event is precluded by the software involved in the adjustment.

The collection of shop floor data is one area in which flexible manufacturing systems excel in providing inventory and attendance information vital to cost-effective plant operation.

Numerical control equipment can also provide the corporate mainframe with data on operator and maintenance personnel errors. Information on operator errors can be used to improve the instructions and procedures that are used on the shop floor. Such improvements can have cost benefits in higher productivity, reduced scrap and longer machine life.

Tracking maintenance errors can also improve procedures that keep machines from being used when the consequences would be tragic and expensive, such as running without lubricant or with open maintenance.

Machine wea

Using feedback data on machine and tool wear is another normal function of current machining equipment. This data is vital to the machine's adaptive control and the manufacturing system's maintenance and repair effort. Wear and breakage records should include the vendor's name, the machine type and the serial number. For tools, the spindle, tool type. number and purchase price should also be included. This information should be analyzed regularly to determine which vendor delivers the most cuts per dollar and to isolate capital absorption areas in the manufacturing system.

One component that does not have a counterpart in nonautomated systems is the cabling required to hook machines together in a local-area network. Environmental local-area network. Environmental local-area network in controlling temperature, humidity, lights and building security. Products that need controlled temperature and humidity would be cheaper if the environment and manufacturing local-area networks were

· Shop floor data, such as the types suggested above, is only of value if it be analyzed on the corporate mainframe. Management should insist that the manufacturing resource planning (MRP) software running on the mainframe accept data directly from the numerically controlled machines. This will save the cost of user data conversion programming and ensure that the mainframe data base is always current. If necessary, MRP II software vendors should meet with flexible manufacturing system designers and arrive at standards for passing the various classes of data between the two systems.

Independent software companies and smaller numerical control equipment producers may have little incentive to participate in this process. However, they should know that large companies that make manufacturing hardware and software will feel no computction in making their competitors' systems obsolete by de facto standardization.

A\$14 BILLION*

MARKET

AWAITS YOU...

See Page 96

"Source: U.S. Dept. of Commerc

Sitler is a senior software programmer with Hobart Corp. in Corington, Ohio.

How strong a shield are vendors' form contracts?



In "Standardized contract clauses winning battles, losing the war" [CW, July 2], Christopher Mislow asserted that computer manufacturers can effectively shield themselves against legitimate user claims by legalese contained in standard form contracts. This seriously misstates the current state of the law.

Without question, most computer purchasers are required to sign con-tracts replete with clauses that purport to limit the buyer's rights. Reduced to ordinary English, the typical purchase contract reads something like this: "We promise absolutely nothing about what our computer is capable of doing, and, in particular, we do not promise that the computer will operate the way that our sales literature and salesman told you that it would. And if, for some reason, some court somewhere should decide that we did promise you something, then you waive all right to monetary recovery for our failure to live up to our promise.

As an attorney who has represented numerous users in lawsuits against giant computer vendors, I can attest to the fact that the courts generally find such clauses as unfair as most readers and will lean over backward to deny effect to them. While there are cases in which the manufacturer has escaped liability based on form contract clauses, in the majority of reported cases, the purchaser has prevailed on one theory or another despite the purchase contract.

The most effective, but by no means the only, method of overcoming clauses that seek to limit the purchaser's rights is to assert and prove fraud. I know of no jurisdiction that allows a vendor that has lied about its products' capabilities to shield itself behind contract provisions in-cluded in its own form contract. Even where the contract contains a clause that purports to disclaim any promise or representation concerning the product, the courts will generally allow the buyer to recover

Fraud claims appear to be particularly common in the computer field because many, if not most, disputes involve exaggerated sales claims and overselling of system capacity. Many other claims arise from the manufacturer's being in such a rush to get to market that he sells the project be-fore it is ready, without bothering to disclose that fact to the purchaser. The purchaser who has become an involuntary test site generally will be allowed to recover.

Even where there is no provable fraud, there are a number of ways in which courts will defeat the effect of the seller's form contract. Therefore, at least in California, it is highly questionable whether a purchas will be barred from recovery, regardless of the vendor's misconduct.

Miller practices law with Perez McNabb & Cook, an Orinda, Calif., firm that represents purchasers in purchaser/vendor disputes.

Texas law is, if anything, more favorable to a computer purchaser than is California's. Under a consumer protection statute that applies to business purchasers as well as indi-

vidual purchasers, a misrepresentation concerning the capa bilities of a product will overcome any contract clauses limiting recovery even if the. vendor did not intend to deceive the buyer and had no reason to know that what he

was saying was wrong. While the law in other states is not always as favorable as it is in California and Texas, it is very far from being uniformly favorable to the large computer manu-

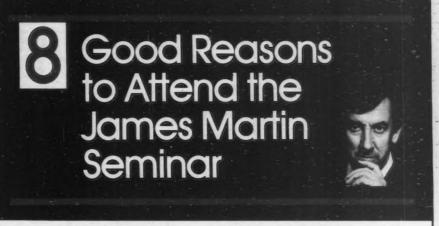
Other means of overcoming the seller's fine print protective clauses may apply depending on the facts of individual cases. For example, most standard form contracts contain a

clause limiting the buyer's remedy for the seller's breach to repair or replace the defec-tive product. A long, if not unanimous, line of cases holds that where there is such a clause, and the seller fails to repair or replace the offending

project, then he will be liable for the purchaser's damages, including lost profits, even if the contract specifically excludes recovery for lost profits. Where the seller fails to live up to his part of the bargain, then most

courts hold that he loses the protec-tion of his "no lost profits" clause. Many other means of overcoming

the form contract clauses may be available. Keep in mind that the courts do not like these clauses and will lean over backward to ignore them when the user asserts that they should not apply. I agree with Mislow, however, that reliance by manufacturers on such clauses is shortsighted in an industry where ultimate success will be measured in terms of satisfied customers, not successfully defended lawsuits. But I cannot subscribe to the blanket proposition that form contracts effectively provide legal protection to computer manufacturers



- James Martin has been writing THE BOOK on the Computer Industry for over 3 decades
- He is the most sought after consultant in the Computer Industry
- His predictions and recognition of major computer developments are unsurpassed.
- With over 31 top-selling books, Martin is the industry's #1 selling author of all time. His book, Application Development without Programmers, is the Computer Industry's #1 selling book of all time.
- James Martin has the unchallenged reputation as the world's finest lecturer in his field. Over 20,000 individuals worldwide have attended the James Martin Seminars. Many return year after year
- James Martin "... can lay fair claim to being the most influential DP guru of all time." - ICP Interface

- 7. A fast-moving, high-density, interactive 5-day program packed with information for all DP designers, management, and staff. Quite honestly, the James Martin Seminar is the industry's best educational value for the
 - Attend the seminar designed to dramatically increase your DP capability.
 - A major increase in productivity is attainable through the methods taught in this seminar.
 - 5 days with James Martin will dramatically alter your approach to DP.

Many DP organizations are beginning to break the cycle of low productivity, poor responsiveness, and high appli-cation backlog of traditional DP. Now is the time for you to act. Attend the James Martin Seminar this spring. Learn the new technologies and their application to your organization. You'll discover why James Martin is . .

8. ... The Man the DP Experts Listen Tol

ADDRESS

Send in the coupon for more information on James Martin's 5-Day Seminar, THE NEW DP REVOLUTION, for general managers, DP managers, systems analysts and designers, and all professionals concerned about increasing DP productivity.

> Call (213) 394-8305 or mail the coupon today for a detailed brochure.

Oct. 22-26, 1984 **New York** Detroit Oct. 29-Nov. 2, 1984 Dallas Nov. 26-3O, 1984 Los Angeles Dec. 3-7, 1984 Send more information on the following lames Martin Seminars

☐ New 5-day DP Revolution Seminar

COMPANY NAME

Technology Transfer Institute

741 10th St., Santa Monica, CA 90402, (213) 394-8305

ROAD from page 47

talking; others suspected that I was too lazy or too old to learn, but that impression was dispelled when they witnessed the struggle I through, insisting on utiliz-ing traditional handwriting and communicating with several ornery typists to get each essay done. Can you imagine their shock when I acquired a personal computer and started to use it, word processing software and all? And that I actually liked doing it? They flipped!

I became an instantaneous convert to using a word pro-cessor when I discovered, quite by accident, that it was fun; more fun than playing Space Invaders, Pac Man or Donkey Kong. And much more fun than talking anyone into staying late to turn "just one more draft."

The version I'm using now

Keyboarding is a small price to pay for the benefits received. My word processor is better at spelling and grammar than most people I've encountered.

has more screen action than just about any video game; especially if you're an amateur. With messages popping up all over, a smorgasbord of mysteries present them-selves in such a way that most adventure games pale by comparison.

True, I yielded to keyboard usage, but all of life involves compromises of one kind or another. Besides, I am convinced that voice entry of text is around the corner for writers - especially for those with limited vocabularies.

Small price

Anyway, keyboarding is a

small price to pay for the benefits received. My word processor is better at spelling and grammar than most peo-I've encountered; it learned to do what it does as flawlessly as is anything done in this world, and why not? It's like having a convention of bespectacled English teachers editing your theme before you turn it in so you'll always get an 'A.' And it doesn't gripe about my ungodly sentence constructions or the words I use.

These thoughts consume me as I sit for today's session with my word processor. It's 7 p.m; I've now done over 40 essays in Computerworld. and the next is due tomorrow, "'Road Warrior' rides again" I'm partially done now and feel the pressure of my deadline steadily grow-ing. Can't let the copydesk down. I vow to have the next one done early, a vow that I've now made over 40 times.

I, now Road Warrior, turn on my word processor "Trans-Am." Shifting Shifting smoothly through the opening sequences and accelerating to edit mode, I head for the sunrise hell-bent on hitting pay dirt - or else it's curtains for copydesk.

Cruising along, I begin to respond to a set of terse requests for information, and lots of it - time, date, directions on how I want my output treated and the Lord only knows what else. It appears to be giving me a test, one programmed by a wicked typing teacher who resents anyone who types poorly

I give it the command to bring up my file and stop horsing around. "Road Warrior hasn't got time for tutorials today," I shout: Whacking away at the keyboard, "Trans-Am" glides over my text — flawlessly absorbing the shock of its presentation.

Suddenly it starts to sense malfunction in its tiring driver; it's way past midnight. It discovers that I'm having trouble formatting and starts preaching the rules until I think I've gone mad.

"Ye gods," I gasp, "it knows I'm lost and desperate for direction." I key with a passion: "Help, help, help!" A stern message appears on the screen telling me, Road Warrior, the rules for help and points out that once is enough. Then in front of my eyes, the screen starts to scroll my text, correcting my lousy spelling, making paragraphs, restructuring my grammar, even rewriting parts of my work.

Thereupon, it issued a massive dose of artificial intelligence; all that any syscould bring to

bathed me and my work in a green phosphor glow. I bowed my head in prayer for the salvation of my work and its ultimate communion with Computerworld in Fra-Mass., mingham, deadline

When the sun rose, "Road Warrior," riding a floppy five and a quarter, cruised around for a while in "drive," waiting for me to figure out how to energize my word processor's out-board modem so it could make the last leg of its jour-

After I place the telephone in the modem's cradle, "Road Warrior" decomposes into atomic particles and streams from my New York office to Computerworld's in a breathless race with deadline

Think of the joy when confirmation comes from copy-desk: "Road Warrior" has arrived and is on its way to print. Slumping with exhaustion, I slowly shut the system down — modem, processor, printer, tube and all. It blinks "Good morning," and I pat it goodnight.

Data Processing Professionals

VSAM (DF/EF), CICS (1.6)

IMS DL/1 & IDMS

- These courses are UNIQUE in several ways:
 Comprehensive instruction in the latest courses in VSAM (with DF/EF) and CICS (1.6).
- "Hands-On" Training with our own IBM 4341/VM/CMS/CICS (1.6) computer and 20 IBM 3278 terminals.
- Write and test your own programs so you are proficient in VSAM/CICS.
 Sessions offered weekdays, evenings and

- weekends.

 Fees are very reasonable..

 Accessible by Path and Subway.

For further information, and registration details please contact Cathy or Charlie at (212) 777-8614 or visit

CORPORATE TRAINING CENTER

10 E. 21st St. (at Broadway) New York, N.Y. 10010

BARR/HASP

The Superior PC-Mainframe Connection



BARR/HASP is the performance-proven communications package designed for the IBM PC and XT.

Your PC and our system can be connected to multiple printers for output faster than 1200 tines-per-minute. You can transmit while receiving output and use the console at

BARR/HASP saves more than time - it saves money. Call for complete details and ask about a trial evaluation.

800-BARRSYS

Emulates IBM 3777-2 or HASP on IBM 360/20.
Communicates with MVS/JES, VM/RSCS, VS1/RES, CDC/NOS.



BARR SYSTEMS, INC.

SEND YOUR IMS PROBLEMS to school

ming assignments, debugging and/or design problems to class. Because they're committed to providing a real-life learning experience ... experience that makes programmers immediately

perience... experience that makes programmers immediately productive in an IMS environment.

Attre/SysEd courses, from Data Base Design, DB (DLII) Application Programming, DC and Message Format Services Programming, and Utilities to advanced Recovery and Restart. are for highly motivated programmers who want to become IMS professionals and are willing to work hard. Our intensive training provides state-of-the-art instruction; a solid foundation in IMS fundamentals and insights into advanced material: extensive "hands-on" experience; and individual attention from highly experificed instruction. highly qualified instructors.

highly qualified instructors. Classes are held regularly at our fully equipped classroom/ computer facilities in New York City and Chicago. Class size is limited, so applications are accepted on a first come first served basis. Customized course offerings are available for on-site sessions at company installations.

ite sessions at company installations.
For more information, call David Shapiro (212) 889-3386

ONE PARK AVENUE NEW YORK, NY 10016



STOP DATA PIRACY!



Anasazi

TO ORDER CALL:

800-223-7250

In California 714-771-7250

Checks, VISA & MasterCards

\$369 ...

The Barrier is a low cost, port protection device that limits access on dial-up lines. Connected between the computer and modem, the unit is fully compatible with all computer systems, including PC's and requires no additional hardware or software

- Functions with any 300-2400 bps asynch modem
- User programmable password lengths up to 32 ASCII Characters (12832 combinations)
- Menu driven for quick & easy set-up 2914 E. Katella Ave., Ste. 202 Orange, CA 92667-9990
 - Disconnects calls after 3 invalid password entries
 - Eliminates re-call delays and extra dialing charges common with "call-back" devices
 - Visually alerts operator of an attempted break-in

IBM VM gets control package

VIENNA, Va. — Software for control of system and operations resources of the IBM VM environment will be made available in September by VM Software, Inc.

The software, VMcenter, is a "comprehensive package to streamline operations, manage system resources and protect data" in such data centers, according to Bob Cook, VM Software's chief executive officer. VMcenter was reportedly designed to control such areas as disk space management, system security, accounting and auditing, work load management and operations.

To allocate disk space better, VMcenter reportedly lets users determine their own space requirements and match them with assigned disk pools. The technique reportedly keeps data center management in complete control of disk storage.

VMcenter is also said to simplify tape processing for operators and users through its device, retention and volume controls. Tape drives are automatically allocated as requests are issued, VM Software said, and tape volumes become available automatically as they expire. Tape volumes are said to be protected through verification by standard labels.

Under VMcenter, tasks such as backups, periodic accounting and spool purges reportedly can be set by operations management to run automatically at off-peak times. VMcenter also allows users to control scheduling of their own work and offers system administrators control over access to resources.

VMcenter is priced at \$27,500 from VM Software at Suite 355, 2070 Chain Bridge Road, Vienna, Va., 22180.

Genesys offers integrated HRMS for IBM systems

LAWRENCE, Mass. — Genesys Software Systems, Inc. has announced an integrated human resource management system (HRMS) for IBM mainframes in the IBM OS and DOS environments.

According to a spokesman, the HRMS—dubbed Genesys—operates in conjunction with IBM's IMS data base management system and includes Genesys Software Systems' All-Screen utility software for customization of the package.

It also includes benefits, personnel and payroll accounting modules.

Each application is accessible on-line, and users can expand the integrated employee record files for benefits, personnel and payroll to reduce data redundancy and errors due to duplicate entries, according to a spokesman.

The system's Benefits Management, Personnel Administration and Payroll Accounting modules may be purchased sepa-

rately for later integration.

The Personnel Administration module offers a master file design with a two-tier data base structure for individual and group records, and it features unlimited record keeping capabilities for compliance with changing government regulation and reporting and for in-house services, the vendor said.

The system's Payroll Accounting module features exception-oriented processing and addresses the payroll requirements of large, multidivisional organizations, the spokesman said.

The complete Genesys HRMS package is priced at \$300,000, and individual modules range in price from \$50,000 to \$110,000.

Additional information is available from Genesys Software Systems, which is located at 20 Ballard Way, Lawrence, Mage 01843 Data Design
Associates, Inc.
has announced a
capital project
management system for a variety
of large computers/\$8

Hewlett-Packard Co. is offering IBM System/34 users a migration path to the HP 3000/58

an IBM MVS diagnostic service has been announced by Morino Associates, Inc./58

An on-line data base of more than 52,000 software packages is available from Menu/60

Digital Equipment Corp. has added two word processing packages to its line of VAX-11 soft-ware/66

INSIDE

Systems Software/66

Productivity Aids/68

Application

Packages/68

Languages/74

Expense? Asset? R&D debate goes on



onsider the scenario: Outerware, Inc., a software vendor, has spent two years and \$5 million developing a revolutionary software package. During that time, the company has written off its research and development costs as an expense and, as a result, has suffered massive losses — no product, no sales.

Now, just as the coding is 90% complete, Outerware runs out of money and has to go to a bank for more. The banker takes one look at the company's income statements, chuckles quietly and goes out to lunch.

On paper, the start-up company is losing big money, but in reality it has the potential to make big profits. The only difference is in the procedure it uses to account for R&D costs. Industry standards now require most software firms to expense those costs rather than capitalizing them as assets. This means that software companies write off the costs in a single year rather than depreciating them over a longer term.

While this succeeds in reducing or eliminating a company's tax burden during stages of intensive R&D, it also can make the bottom line of a small firm "look like a roller coaster," according to John MacKinnon, a partner at the accounting firm of Price Waterhouse & Co. in Boston.

Over a period of years, even a small See R&D page 74

SOFTLINE/LES GILLIAM

Diversity, not intensity, the best approach to staff motivation

ost information systems managers are under significant pressure. With a limited staff, a restrictive budget and deadlines that keep closing in, the manager's tendency is to take a shortsighted approach and call for a nose to the grindstone response from the staff. In so doing, he may expect to see an increase in employee burnout, a loss of enthusiasm and the creation of software hermits.

Software hermits are those people whose activities are limited to a very narrow scope, who are never exposed to new ideas or new technology and who will, over time, become lethargic and lose their creative spark.

The wise manager will take the longer range viewpoint of developing his staff to its greatest potential

by providing challenging work as well as the opportunity to grow. These opportunities often require the employee to get out of the rut and away from the office.

Shown below are seven ideas that the manager can use to provide motivation for his staff. All of these need not be applied to every staff member. Annual budgets of expense money and employee time should allow for a predetermined allocation devoted to one or more of these categories. This plan, which you can call training, education or personal development, should be carried out completely and not curtailed due to system deadlines or work load.

■ Field trips. There are many an-

Pield trips. There are many analyst/programmers today trying to design and develop a computer solution when they do not really understand the business problem. The analyst needs a first-hand observation of the people and environment in the user's business area. A tour of the user's factory, warehouse, store

or offices will go a long way toward providing the understanding necessary to develop a satisfactory solution. In addition, if the programmer can meet and talk with some of the end users who will be involved with the results of the processing, a significant motivational seed will be

Users groups/industry meetings. There are hundreds of users groups associated with various vendors. These groups hold both local and national meetings to learn about the latest hardware and software technology and to discuss and address problems of mutual interest. Computer industry organizations also sponsor exhibits and presentations. Sending an employee to these types of sessions will not only increase technical knowledge, but will also allow him to rub shoulders with his peers in the profession and to gain new ideas and inspiration, which can be applied immediately to the challenges back home.

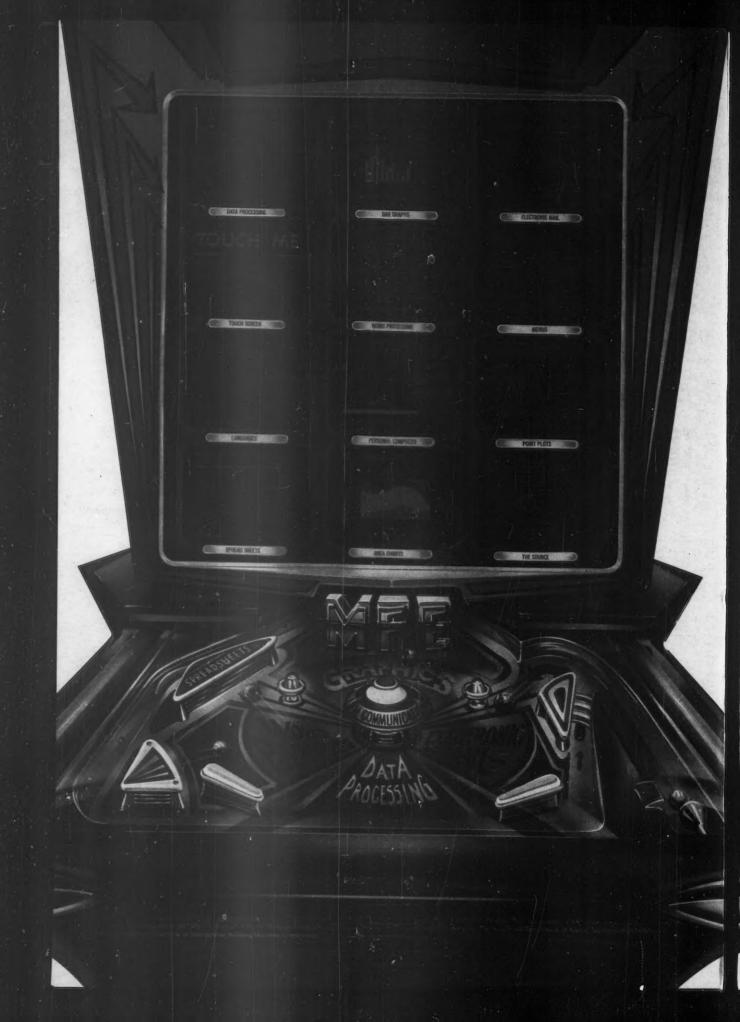
Seminars and classes. The rate of change in technology is overwhelming. You can choose to ignore it, but you may be missing out on ways to increase productivity greatly. You may also restrain your people from employing the newer tools of the trade, causing them to seek greener pastures or to hang around and grow complacent. Selectively enrolling employees of all levels in profitable learning opportunities is a sound investment.

■ Vendor presentations. Vendors continually seek ways to inform customers and prospects about their product lines. Local presentations of new products are an economical opportunity for some members of the software staff to broaden their visions. They will also see how a professional presentation is conducted, which, of course, is free education.

Visits to other companies. One of the most important ways to expose the software staff to new ideas

See MOTIVATE page 74

Gilliam, an independent consultant based in Ponca City, Okla., is a regular contributor to Softline.



Four-Phase is helping more than 2,000 DP managers win the productivity game.

Now it's your turn.

It's easy to win the distributed information processing game when you play it with the Series 4000 from Four-Phase. The Series 4000 is an integrated, growth-oriented system designed to communicate within your IBM environment. No other vendor gives you so many functions for so many years at such affordable prices. In the distributed processing arena, that's the way to score points with both end-users and top management.

COBOL-Industry standard COBOL is used to write programs for handling keyboard-entered data and general batch processing.

When they want PC's, you've got them!

If your end-users are like most these days, they're clamoring for their own personal computers. We play that

The action starts with the

Multifunction Executive.

The key to the Series 4000 game plan

is the Four-Phase Multifunction Executive (MFE). This unique and powerful control

program monitors each multifunction

terminal in your system. Its ability to run

multiple software programs allows your users to perform 16 different tasks from

any terminal on the system. And each of

your users can access all of our software packages with one keystroke. You get

Four-Phase was the first company to introduce the integrated approach to multifunction distributed processing. Today, there are more than 15,000 installed Series 4000 systems, helping people like you manage the information needs of over 150,000 end-users. And every machine is backed by our Customer Support Operation and over 1,000 field service people to provide continuing support and reliability at every level.

Four-Phase customers have been winning the DDP game for years. You can, too. To find out how, call us today at 1-800-528-6050, ext. 1599. In Arizona, call 1-800-352-0458. ext. 1599. For a free poster of this illustration, write to us at 10700 North De Anza Blvd., M/S 52-6A9, Dept. P., Cupertino, CA 95014.

VISION, FOREWORD and Multifunction Executive are regis trademarks of Four-Phase Systems, Inc. MOTOROLA and (A) are registered trademarks of Motorola, Inc. Four-Phase and the Four-Phase logotype are registered trademarks of Four-Phase Systems, Inc. GMS/IV is a trademark of Four-Phase Systems, Inc.

You win the DDP game with software.

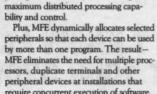
Four-Phase provides one of the most impressive and complete collections of software ever offered from one company. Our packages make integrating Four-Phase computers remarkably easy. And guarantee a logical growth path for years to come. Here's just a sample of what we provide:

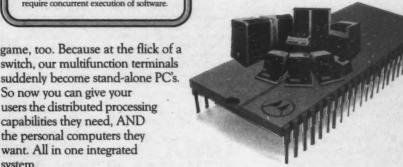
Interactive processing: VISION°-For creating custom applications from order entry to transaction processing. It provides a high level of functionality that can be used in any distributed environment. And VISION is easier and faster to program than COBOL.

Word processing: FOREWORD -Our powerful shared-logic word processing system allows text to be entered, stored, edited, distributed and printed.

Graphics-For business graphics, the Graphics Management System (GMS/IV) gives you an easy way to condense and conceptually present data that's easily understood by decision

switch, our multifunction terminals suddenly become stand-alone PC's. So now you can give your users the distributed processing capabilities they need, AND the personal computers they want. All in one integrated system.









Data Design offers management system

Said to monitor progress of large expenditure programs

SUNNYVALE, Calif. - Data Design Associates, Inc. has announced the Capital Project Management System (CPMS) for use with a variety of large systems.

According to a spokesman, CPMS will monitor the progress of construction projects and other large expenditure programs to ensure that allocated funds are being properly spent within a budgeted framework.

It will function in an on-line, realtime mode on IBM 4300 and 30 series and larger processors and on Hew-lett-Packard Co.'s HP 3000 line. It will also work in batch mode on

roughs Corp., Honeywell, Inc., Digital Equipment Corp., Data General Corp. and Sperry Corp.

The spokesman said that when a project or project phase is completed, CPMS automatically translates expenditure data into a fixed asset, in accordance with specific user instructions. The system features Data Design's Advanced Systems Architecture so that CPMS can integrate with the company's other financial systems. Included is a series of standard reports that can inform users of the amount each project phase is over or under budget.

translations of expenditure data to fixed assets, enabling users to experiment with different cost combinations in establishing fixed asset valfor depreciation purposes, according to the spokesman

It can take a single expenditure, parts of an expenditure or groups of expenditures and combine them to make one asset, and it can allocate parts of expenditures to different components of a project.

CPMS is scheduled for shipment this fall. Prices begin at \$15,000 from Data Design Associates, 1279 Oak-Pkwy., Sunnyvale, Calif.



If your business depends upon computers and you do not know how UNIX will allow it to grow, your computer system could be threatened by obsolescence.

However, if you do know about the explosive emergence of UNIX as an industry standard for business, engineering, and scientific computers, in a multi-user and multitasking environment, you'll stand to reap extraordinary benefits

Benefits that free you from the tyranny of dependence on a single hardware manufacturer. Protect your investments in software when you want to upgrade hardware. In short, the benefits of UNIX will grant you a freedom of choice that you never had before.

UNIX SYSTEMS EXPO/84 offers an unprecedented opportunity for business managers, information systems professionals, and all others with a need to better understand the full impact of UNIX. Over 150 of the industry's leading and most innovative companies will be exhibiting the latest hardware and software products. More than forty informative sessions will be offered and oriented to issues that are of prime concern to current and prospective users of UNIX-based systems.

The choice is yours. You can be content with your understanding of computer



technology as it is. Or you can learn everything you need to know about UNIX. And grow

Act now for early registration discount. Send the coupon below prior to August 15th for a complete information package and pre-registration form.

Name		0
Title		
Company		
Address		-
Telephone		
City		
State	Zip	

Complete and mail to: Computer Faire, Inc. 181 Wells Avenue, Newton, MA 02159

September 11-14, 1984

An exclusive production of Computer Faire, Inc.

*UNIX is a trademark of AT&T Bell Lab

HP unveils path from System/34 to HP 3000

PALO ALTO, Calif. — Hewlett-Packard Co. has announced a product that can be used to migrate software from an IBM System/34 minicomputer to an HP 3000. After the change, IBM RPG programs run in native mode on the HP 3000 at least as fast

as on the System/34.

Called HP Transform/3000, the product consists of three elements: upgrade utilities that bring over procedure and data files, a process monitor that speeds execution of a set of commands that performs System/34 functions on the HP 3000 and on-site consultation services

The transfer is made possible by HP's Procmon process monitor. Proc-mon gives the HP 3000 System/34-like features, but without an emulator, the company claimed. Most recoding required by the migration is thus eliminated.

HP Transform/3000 runs on any HP 3000 equipped with the company's MPE operating system and the RPG compiler, either version 6.0 or

The migration process can be completed at a price of about \$15,000 without interruptions in ongoing operations, a spokesman said.

HP is located at 3000 Hanover St., Palo Alto, Calif. 94304.

Morino unwraps **MVS** diagnostics

VIENNA, Va. — Morino Associates, Inc. has announced the MVS Problem Alert System (MVS/PAS), a diagnostic service designed to help IBM MVS operating system users avoid maintenance delays and increase system availability and capac-

According to a company spokesman, MVS/PAS is an ongoing service that automatically validates IBM systems software maintenance levels to focus attention on significant soft-

ware quality problems.

MVS/PAS is said to supplement
the use 'M software maintenance
produc. such as Info/MVS and the System Modification Program.

The spokesman said subscribers to MVS/PAS receive a current data base and a Software Maintenance Analyzer. Every two months, the data base is updated on the basis of the company's research and is sent to the user. The analyzer can then be used to produce maintenance reports.

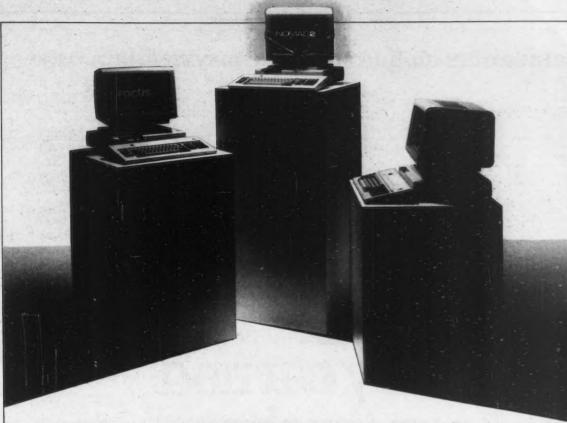
Data in the data base is collected from Morino's field experience, Info/ MVS and the Early Warning micro-

An MVS installation uses the MVS/ PAS Software Maintenance Analyzer to run installation maintenance data against the MVS/PAS data base

The service is said to allow installations to produce various custom

maintenance reports.

MVS/PAS can be licensed at an annual fee of \$12,000 from Morino Associates, located at 8615 Westwood Center Drive, Vienna, Va. 22180.



When NOMAD2 Takes The Gold, The Real Winner Is You!

If you're currently trying out FOCUS for your software team, NOMAD2 should be in the race. You'll find that NOMAD2 takes the Gold.

NOMAD2 is the choice, whether your goal is increasing the productivity of your programming team or satisfying your fans, the end-users.

Some of NOMAD2's winning attributes are:

- Relational and Hierarchical
- Interactive and Batch
- Procedural and Non-Procedural
- Statistical Analysis and Modeling and Graphics
- Multiple Layers of Security
- Runs on VM and MVS/TSO and the IBM PC XT/370

We're not just some Johnny-Come-Lately company that passes you the baton and sprints for the locker room. D&B Computing Services entered the race in 1967. We've had 17 years to sharpen our documentation, service and support skills—the necessary equipment for a first-place finish. And NOMAD was first introduced in 1975, giving us nine years to fine tune it to championship caliber. So talk to us before you make your decision and your decision will be NOMAD2.

Roger Cox
D&B Computing Services
187 Danbury Road
Wilton, CT 06897
or call Roger at (203) 762-2511

Name
Position

Company

Address

City State Zip

For more information please fill out this coupon and mail to:

NOMAD2...Experience the difference

D&B Computing Services

NOMAD is a registered trademark of D&B Computing Services, Inc.

a company of The Dun & Bradstreet Corporation

Menu offers on-line software product data base

By Paul Gillin

FORT COLLINS, Colo. — Menu has announced an on-line data base service that is said to include descriptions of more than 52,000 software packages for use on mainframes, minicomputers and microcomputers. Customers can search the data base by calling the company or accessing the service through Dialog Information Services, Inc.'s Dialog service. Software can also be purchased through Menu, the company said.

By calling toll free 1-800-THE-MENU, customers can search for software with up to 16 keywords and receive a printout containing detailed descriptions. Menu also optionally offers a printout of third-party evaluations. The search costs \$25 for the first 10 programs located, \$1 per program for the next 40 programs and 25 cents per program thereafter. If a customer purchases the software through Menu, the search fee is credited against the purchase price.

If Menu cannot locate the desired software, the customer's request is filed into a data base and the customer is notified as soon as a suitable program is found.

Software can be ordered through Menu at up to 25% below retail price. Delivery is usually within 10 days. A spokesman at U.S. West, which

A spokesman at U.S. West, which is Menu's first large corporate account, said the regional holding telephone company chose the service for the size of its data base and its objec-

"It's a really dandy service," said Norman Lorentz, U.S. West's manager of market planning within the MIS department. "The Menu people know what's out there. They're also talking to users to find out how good the products really are."

U.S. West may eventually expand the program to include a large part of its more than 50,000 employees, Lorentz said. Each user will receive a Menu packet and an identification number. The corporation will pay for all business use of the service.

Lorentz noted that the MIS depart-

ment is likely to employ Menu in its own purchasing procedures for minicomputers and mainframes. "Right now, we use [Datapro Research Corp.] reports and others to find software," he said. "I think in the future we'll use Menu equally or more than those sources."

Menu is located at 1520 S. College Ave., Fort Collins, Colo. 80524.

Multilingual WP out for VAX-11

LOWELL, Mass. — Compuplex, Inc. has announced Multilingual Word Processing (MLWP), which allows a Digital Equipment Corp. VAX-11 series computer to complete word processing in a number of different languages.

Compuplex said that users can choose from more than 192 different languages, including French, Spanish, Hebrew, Russian and Portuguese. Help screens, prompts and error messages are displayed in the chosen language.

Users are able to run a number of different language word processing applications on one screen, Compuplex said. Languages read from left to right can be displayed with those reading right to left.

reading right to left.
Prices for MLWP range from \$7,500 to \$100,000. For \$7,500, the user receives word processing software in two languages that runs on a Microvax with 1M byte of random-access memory.

Additional languages are available for approximately \$1,500 each. The \$100,000 represents a complete turn-key word processing system that runs on the VAX-11 minicomputer.

Compuplex is located at 188 Middle St., Lowell, Mass. 01852.

Financial tool announced

AUSTIN, Texas — Execucom Systems Corp. has announced the Interactive Financial Planning System/Dimension (IFPS/Dimension) package for users of IBM mainframes under IBM's TSO and CMS and Prime Computer, Inc. processors.

IFPS/Dimension combines relational data base management (DBMS) facilities with a modeling and planning system. It is said to incorporate the design features and command syntax of IBM's SQL to allow users to perform inquiries using free-format, English-like commands to solve dataintensive problems.

The package is fully integrated with Execucom's IFPS financial planning system to give users access to all IFPS capabilities, including command files to automate systems.

files to automate systems.

The relational DBMS capabilities of IFPS/Dimension and the data handling facilities of IFPS provide various support capabilities. IFPS/Dimension is priced at \$25,000 from Execucom Systems, 3410 Far West Blvd., Austin, Texas 78731.

"Data Check Recovery earned its keep for the next hundred years with just one use."



Mark Neal, Systems Programmer for Federal Express in Memphis,TN

"At Federal Express, our computers are an integral part of the overnight package delivery service we provide. Without them our entire operation – from billing to timely delivery – would grind to a halt.

"We took a hit on our Uninterruptible Power Supply, causing us to lose power to our computers. When power was restored, we found that there was an apparently unrecoverable error on our log data set. We couldn't bring up IMS completely, and there was some question about the integrity of our data base.

"Our options were: to run one of the IBM utilities, deleting some of the bad data; to cold start IMS and lose some of the transactions that hadn't made it into the data base; or because we had Data Check Recovery – to spend a couple of minutes correcting the bad data and continuing the run. No data lost. No hours spent in restoration and recovery.

"Data Check Recovery earned its keep for the next hundred years with that one use. Now, we're incorporating DCR usage instructions in our standard operations manual."

Data Check Recovery is a powerful, dependable utility

that recovers data that has become unreadable due to permanent I/O errors—hard data checks, track overruns and several types of equipment checks. Data Check Recovery supports all OS operating systems.

For more information about how DCR can keep permanent I/O errors from turning into permanent disasters, call Software Corporation of America toll-free at 800/368-7638. In Virginia, III.

call 703/471-1545.
455 Carlisle Drive
Herndon, VA 22070
(703) 471-1545

Software Corporation of America



CSperry Corporation, 1984

A fast selling car needs a fast moving computer system.

Subaru. Over 150,000 a year are sold even before they reach the U.S.

And long before they're off the ships, they're on the Sperry MAPPER™ System. Allocated to distributors. Assigned to dealers. Complete with work orders.

Working off a Sperry computer, 300 MAPPER terminals provide a total communications system between Subaru of America and the distributor network.

Distributors get the information they need with less than a 3-second response time. No DP skills are needed. No tech people are needed. All data is visible in report format so anyone can read it.

And commands are given in plain English, giving users the capability of tailoring runs to their own individual business needs.

Locating parts, a major problem for most car manufacturers, is no problem for Subaru. Stocks of 28,000 parts are inventoried and controlled on the MAPPER System. Punch it in and you can see instantly where the parts are and how many of each is available.

Don Finello, Director of Data Processing at Subaru of America states, "At Subaru, MAPPER isn't just a report generator. Management, Accounting, Sales, Parts, Advertising—all departments use it."

MAPPER has made the user self-sufficient. Control of the information is back in the hands of the people responsible for getting the job done. The people who know the job best.

And it's a system geared for growth. An important thing when you're moving as fast as Subaru.

For more information or a demonstration on the MAPPER System write Sperry Corporation, Computer Systems, Department 100, P.O. Box 500, Blue Bell, PA 19424-0024. Or call toll-free 800-535-3232.



DIGITAL DISPLAYS THE TERMINALS BEST ENGINEERED FOR BUSINESS.

Before you make any investment in business graphics terminals, it really pays to investigate what you'll be using them for.

If you're like most businesses, your terminals will be used approximately 70% of the time for generating text and numbers. And only around 30% of the time for strictly graphics purposes. The October 1983 Infosystems article, "How to Buy Graphics Displays," coauthored by Jim Warner, CEO of Precision Visuals, Inc., states, "While it may be true that one picture (chart. graph) is worth a thousand words, there will always be the need for words, thousands of words, in the day-to-day activity of the office. Special graphics-only devices can have limited value in a general office environment."

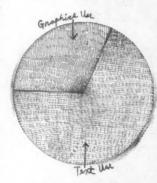
At Digital, the first step in engineering every product we make involves a thorough analysis of who will use it, what it will be used for and which features will help make people more productive in their jobs.

That's been true of every terminal we've designed and helps explain their widespread acceptance and popularity.

And you'll find it's equally true of Digital's latest entries, the VT240™ and VT241™ terminals.

ENGINEERED BEST FOR WHAT YOU NEED MOST.

As the newest members of Digital's family of terminals, the VT240, a conversational



text and graphics terminal, and the VT241, with the added

dimension of color, continue the tradition of engineering excellence for performance. They offer full VT100" compatibility to take advantage of a host of offerings already developed. And to meet the needs of the business environment, you'll find a set of standard text features that are either unavailable on other terminals or may have to be purchased at an additional cost.

These features include bidirectional smooth scrolling, split screen, a choice of 80 or 132 columns per line and a double width/double height format. A highly legible 8 by 10 dot matrix character font displays true ascenders and descenders for exceptional crispness and legibility. If cer-

tain information needs to be highlighted, you can select from a combination of bold print, blinking and underlining in either normal or reverse video. For your added convenience, there's even a built-in printer port for printing hard copy.

Both the VT240 and VT241 terminals give you the option of erasing selected character positions on the screen for more efficient communications and increased productivity. For those applications that require data to be entered by filling in the blanks of a form, once the data has been accepted by the host, the filled-in information-and only that-can be erased by means of a single command. The form itself remains-up on the screen and is ready to accept the next data entry sequence.



© Digital Equipment Corporation 1984. Digital, the Digital logo, VT240, VT241, ReGIS, VAX-11 DECgraph, VAX-11 DECslide, LVP16 and VAX are trademarks of Digital Equipment Corporation. Tektronix 4010/4014 and Tektronix Plot 10 are trademarks of Tektronix, Inc. TELL-A-GRAF and DISSPLA are trademarks of Integrated Software Systems Corporation. DI-3000, GRAFMAKER and GRAFMASTER are trademarks of Precision Visuals, Inc.



Both the VT240 and VT241 terminals generate bit map graphics in a choice of two protocols-Digital's ReGIS™ (Remote Graphics Instruction Set) and Tektronix 4010/4014.™



ReGIS lets you create and store business graphics as simply as producing ASCII text. With VAX-11 DECgraph™ and VAX-11 DECslide™ software, even a novice can prepare graphs and charts and turn them into slides. Selfexplanatory icons let you

choose a box, circle, line, polygon, triangle or arc.

The Tektronix 4010/4014 protocol supports the full array of existing 4010 compatible graphics software. Besides, Tektronix Plot 10,™ TELL-A-GRAF™ and DISSPLA™ from ISSCO® and DI-3000.™ GRAF-MAKER™ and GRAFMAS-TER™ from Precision Visuals are also supported.

When you're using third party software, Digital provides you with the total hardware/ software solution: video terminals, hard copy with the LVP16™ Pen Plotter and the VAX™ computer.

THE HIGHEST AWARD FOR ERGONOMIC DESIGN.

Your people have to spend long hours in front of a terminal. It stands to reason the easier they are to use, the more productive the results.

That's why so much time and thought have gone into the

VT-240

VT-241

does not put a strain on

the eyes. Plus, it tilts to adjust to

the exact viewing angle that's

most comfortable to work with.

ruggedly constructed, yet light

There's a standard type-

The detachable keyboard is

enough to place on your lap.

Even the way the keyboard

has been arranged boosts

writer keypad so you can

productivity.

EA -50

LA-100

ergonomic

design of the

VT240 and VT241.

non-glare monitor

First of all, the

computing strategy. This means our products are engineered to

LVP 16

HOST

work together easily and expand economically. Only Digital provides you with a single, integrated computing strategy direct from desktop to data center.

For more information and the name of the **Authorized Terminals** Distributor or Digital Representative near you, call 1-800-DIGITAL, extension 700. Or write Digital Equipment Corporation.

2 Mount Royal Avenue, UP01-5. Marlboro, MA 01752.

E BEST ENGINEERED COMPUTERS IN THE WORLD

DataCalc V3 **Electronic Spreadsheet**

HICH PERFORMANCE—the calculation section is now written in NATIVE MODE assembly language. ADVANCED FEATURES—such as SORT. on-line HELP: three climensional interconnect, incles of saved spreadsheets, 80/132 column display, individual variable column widths and automatic consolitation. FUNCTION LIBRARY—including table look-up, if-then-else, loan payment, net present due, weighted average and many more

RT-11 TSX-Plus CTS-300 CTS-500 VAX/VMS

VAX: \$1795 Demos: \$50

OATATREND (801) 487-0531 395 Ironwood Dr., Salt Lake City, Utah 84115

Xidak 'Structure Blaster' boasts universal data conversion facility

PALO ALTO, Calif. - Xidak, Inc. has announced the Structure Blaster, which is said to provide data portability across computing sys-

According to a company okesman, the Structure spokesman, the Structure Blaster works with a variety of computer systems, including IBM 370 series main-frames; Digital Equipment Corp. Decsystem-20s and VAX-1,1s; Apollo Computer, Inc.'s Domain; and Sun Microsystems, Inc. Sun workstations.

Structure Blaster provides a general high-speed I/O capability for complex data structures, and it supports data portability through a universal data conversion facility.

An alternative

The Structure Blaster is designed as an alternative to data bases, particularly when an application program requires storage and high-speed access to sophisticated data structures, the spokesman said.

Any data structure reportedly can be read or written to a file with a single procedure call, and the data structure can be changed without requiring any change in the I/O

The spokesman said that on output, the Structure Blaster traverses the entire structure and writes it into a single contiguous portion of a

Input operations

On input, the system allocates a single contiguous portion of memory, reads the data structure into memory with the fastest form of I/O available from the underlying operating system and re-locates all pointers and string references, according to the spokesman.

The product writes all necessary descriptive information for the data structure to the file, allowing conversion of the data structure in one machine's format to that of another machine, the spokes-

man said. Structure Blaster is scheduled to be available at the end of the third quarter, 1984, according to the spokesman. It is priced be-

tween \$400 and \$4,000. Xidak is located at 974 Commercial St., Palo Alto, Calif. 94303.



10-NET takes the work out of networking. Everything you need is in the box.



Imagine being able to connect your PCs simply and inexpensively into a true full-function local area network.

Now you can . . . with 10-NET, a complete package designed so that you can easily install, learn and use it immediately. Everything you need to connect one PC into the network is included.

10-NET is uniquely different from other LAN products in that it requires no dedicated hardware to serve the rest of the network. It is a truly distributed system where your resources may be shared, including expensive hardware and application programs.

You can also share as much or as little data as you wish, with total data integrity and selective security.

You get built-in extras, too: like electronic mail: calendar; "Chat," a user-to-user communication facility; printer spooling; and "News," a bulletin board function for network users.

And, vou can create a multi-user DBMS with unbelievable power and flexibility when you use 10-NET with 10-BASE, a powerful, easy-to-use DBMS designed specifically to work with 10-NET.

Invest in 10-NET now. You can start simple, and expand as your business grows. And, at \$695* you won't find better performance or value, anywhere.

Ask your software dealer for 10-NET, or call 1-800-358-1010 (1-800-782-1010 in Ohio), and start getting some real work done. Dealer inquiries welcome. suggested retail



HARDWARE: PC plug-in circuit card, tap box, and cable to connect them Type: Carrier Sense Multiple Access with collision avoidance Speed: 1.0 million bits per second Distance: up to 3,000 ft. between

SOFTWARE

No dedicated server required Concurrency control-implicit & explicit Security-User, File, Node ID Ethernet compatibility—address message format

SYSTEM REQUIREMENTS:

- IBM PC, XT or compatible PC-DOS 2.0, MS-DOS 2.0

- 128K RAM
 One or more disk drives
 A cursor addressable monitor
 Media: simple twisted pair wire





START NETWORKING NOW-Write for more information, or fill

attach this to your business card or letterhead.

Send more product Have a sales representative call Send a dealer kit

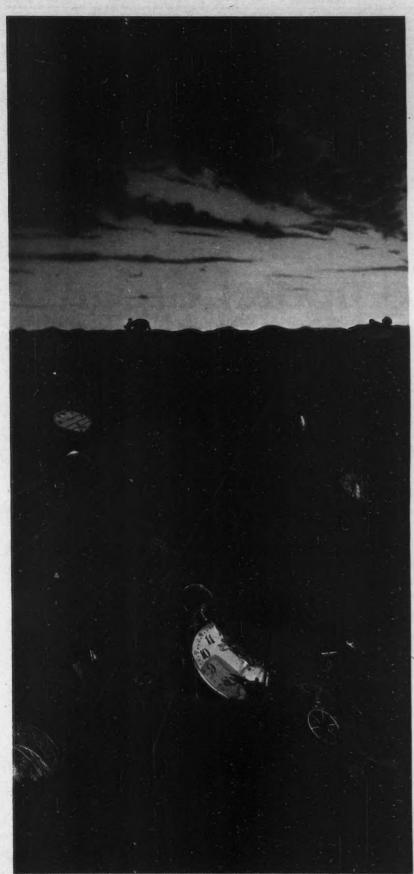
Send 10-NET. I need units. (NOTE: you need one unit for each PC you wish.to network.) Here's my P.O. Number.

I understand Fox will invoice me for \$695 per unit plus shipping. handling and tax (where applicable).

Send to: Fox Research. Inc. Attn: National Sales Manager, 7005 Corporate Way, Dayton, Ohio 45459.

CW 8-13





Peat Marwick technology has exploded the myths about computer systems development:
It doesn't have to take forever or cost the earth.
Introducing Structured Retrofit.

Even the best-managed computer system can develop spaghetti code over the years. Changing demands and expanded requirements can make yesterday's state-of-the-art a state of confusion. And until now you haven't had a cost-effective way of replacing your system.

But now Peat Marwick has the answer: a technological breakthrough that gives you the best of both worlds: the technical currency of a new software system at an affordable price. It's called Structured Retrofit. Its advantages are simple: You save the valuable existing information from your present system by regenerating it in a structured format that is then used as a base to build your new target system. Even on a new computer.

Your immediate benefit is you can produce your new system with savings in time and expense as great as fifty percent of that needed to write an entirely new system. Only Peat Marwick's software engineering services, like Structured Retrofit, can do this. And you gain the advantage of a major reduction in maintenance programming costs.

Peat Marwick's software engineering technology creates workable solutions for your business problems. Learn more about the advantages of systems development through the Structured Retrofit process. For a free brochure, send in the coupon or call 800-344-3600 (in Illinois 800-328-4200).

Mail to: Peat, Marwick, Mitchell & Co. 345 Park Ave., Box SR, New York, NY 10154

Name	
Title	
Company	
Address	
City	
State	Zip
	SR-CW-8/13/84



Accounting and Auditing/ Tax Services/Management Consulting/ Private Business Advisory Services

SYSTEMS SOFTWARE

LANDMARK SYSTEMS CORP. Mantis support for the Monitor for CICS

Landmark Systems Corp. has announced that its Monitor for CICS now supports IBM CICS programs developed using Cincom Systems, Inc.'s Mantis fourth-generation programming language

According to a spokesman, the Mantis support feature enables users to perform transaction reporting and accounting at the application level. Previously, all transactions under Mantis were identified by the same code, and users were only aware that a transaction was being completed. Now, the Monitor for CICS identifies for users what is being done and by whom

The Monitor for CICS also sup ports Oxford Software Corp.'s User Files Online (UFO) system and the Development Management Systems (DMS) from IBM. The package allows reporting and accounting at the application level when used with Mantis. UFO and DMS.

Landmark also announced Monitor for CICS support for additional IBM systems, including MVS/XA, SSX and CICS 1.6 under DOS and CICS 1.6 and 1.6.1 under OS. Permanent licenses for the all the systems are priced at \$6,500 for DOS and \$13,500 for MVS

Landmark Systems, 6142-B Rose Hill Drive, Alexandria, Va. 22310.

NCR CORP. Software Development Environment

NCR Corp. has introduced a pro grammer's workbench program said to provide programming aids and tools intended to simplify the task of software development.

Software Development Environment (SDE) includes more than 120 individual, integrated tools for software development and maintenance. Tools are provided that generate test data and test programs. Other tools are said to provide a change control facility so that changes to programs can be tracked for auditing purposes.

More than 50 utility tools are provided that merge, rearrange and re-format files; print simple reports; and perform other functions.

The program includes a computer-based training course for SDE users, two modes of operation and on-line

Help, the vendor said. SDE also provides a library storage facility that can be used as a central repository for source programs. Within SDE, file access is controlled by an access manager that provides ecurity for SDE files.

SDE is available for NCR's VRX

operating systems. A license is priced

at \$265/mo. NCR, 1700 S. Patterson Blvd., Dayton, Ohio 45479.

PANSOPHIC SYSTEMS, INC. EZ/Key Version 2.1

Pansophic Systems, Inc. has an-nounced Version 2.1 of its EZ/Key integrated prompter and syntax-directed editor for use with the company's Easytrieve Plus information retrieval and data management system.

According to a spokesman, the enhanced version features added sys-tem tuning parameters to expand performance. The parameters allow

ued on page 67

DEC offers VAX-11 word processing tools

MAYNARD, Mass. — Digital Equipment Corp. has announced two Digital

word processing packages for its VAX-11 line of superminicomputers. According to a spokesman, the WPS-Plus/VMS word processing package is a full-function word and document processing system featuring full screen editing, rulers, tabs, underlining, bold type, centering, li-brary text and other menu-selectable functions, with on-line Help facili-

The system also offers integrated, on-line, computer-based instruction that can be accessed without leaving

the current document.
In addition, the package features list processing, sort and mathematical functions and an integrated filing system with keyword search for each

Also offered are user-definable processes for frequently used key sequences that allow a single keystroke to accomplish a sequence. A user-definable print facility is available for formatting page layouts, sizing and print pitch.

The second package, a DEC version of Microsystems Engineering Corp.'s Mass-11 word processing software, offers functions similar to those of WPS-Plus/VMS and has special features for the technical, legal and financial markets.

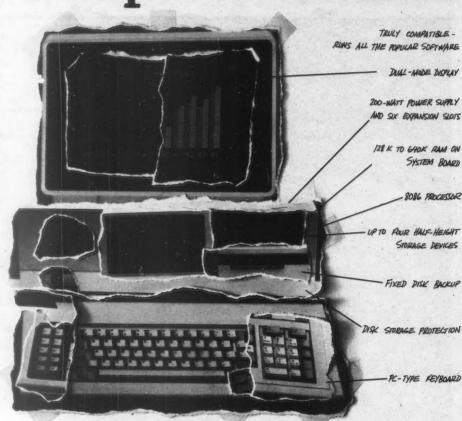
It features a technical character set with equation editing support; footnoting; redlining; numbering; composite automatic documents; column cut and paste; mini key pad numeric entry; footers and margins; and user-definable defaults and profile tables to tailor the operation to

WPS-Plus/VMS is priced at \$6,000 and will run on the VAX-11/730, VAX-11/750, VAX-11/780, VAX-11/ 785 and Vaxcluster syst

The DEC version of Mass-11 is available under the Digital Classified Software Program and is priced at \$9,000. It will run on VAX-11/730 and larger systems, according to the

DEC's address is Maynard, Mass.

omputer dreams.



Introducing the new COMPAQ DESKPRO. COMPAQ combined the best features of the best desktop computers. And then added exclusives you won't find on others. Today they're together in one personal computer. The COMPAQ DESKPRO.

The COMPAQ DESKPRO is the most expandable desktop you can buy. It can grow as you grow, with up to six available expansion slots and four storage devices including a unique fixed disk drive backup—all inside the computer instead of out, saving your desk from clutter.

It's the most rugged desktop, too, because it's the only desktop with a shock-mounted mass storage compartment to help keep disk drives in alignment and help protect you from losing data, downtime, and dollars.

It's also the most compatible desktop, giving you true hardware and software compatibility with the industry's most popular personal computers. The COMPAQ DESKPRO runs thousands of programs written for the IBM* PC and XT right off the shelf. Which brings us to the next point.

"1984. COMPAQ" is a Registered Trademark and COMPAQ DESKPRO" is a Trademark of COMPAQ Computer Corporation. IBM® is a Registered Trademark of International Business Machines Corporation

Continued from page 66 all or specific users to utilize incremental checking, select the size of the system buffer pool, specify the maximum number of errors inserted by the firm's EZ/Checker and control the use of foreground and background execution facilities.

Other features of Version 2.1 include passwords for greater control of system administrative functions, support of the Easytrieve Plus IDMS (a product of Cullinet Software, Inc.) and reduced paging in all environ-ments. EZ/Key is said to provide control to alter the amount of virtual storage and CPU time used.

EZ/Key is priced at \$9,000 for IBM's DOS environment and \$15,000 for OS. Easytrieve Plus is priced at \$21,000 for DOS and \$27,000 for OS.

Pansophic, 709 Enterprise Drive, Oak Brook, Ill. 60521.

INFOTEK SYSTEMS, INC.

Infotek Systems, Inc. has an-nounced a new release of its report formatter for programmers using Hewlett-Packard Co. HP 3000 mini-

Production Report Writer (PRW) 3000 is said to be compatible with HP's Dictionary/3000 data dictionary. For Cobol programmers, PRW/3000 is also said to enable users to use the Copylib or Cobol program instead of or in addition to the data dictionary. For non-Cobol programmers, it provides a special source library

With PRW/3000, programmers reportedly have the ability to define their own data types and control the HP 2680, 2687 and 2688 laser printThe report writer is available for

Infotek Systems, 1400 N. Baxter St., Anaheim, Calif. 92806.

VALUE COMPUTING, INC. DCDS/A

Value Computing, Inc. has an-nounced the addition of a report archiving and retrieval facility to its Data Center Distribution System (DCDS) on-line report distribution package for IBM processors under IBM's MVS.

According to a spokesman, the cost-free DCDS/A option enables users to archive reports, assign retention periods of generations and days and retrieve archived reports for printing. It is designed to provide backup copies without requiring job reruns, and it ensures the security of sensitive reports by providing several levels of protection for archived

The spokesman said the archiving and retrieval tasks are assigned security codes at installation. Users can assign passwords to individual reports as they are archived to protect them from unauthorized retrieval.

The system enables users to duplicate past report distribution, and users can retrieve and print reports ac-cording to the same DCDS parameters under which they were first produced.

The DCDS package, including archiving, is priced at \$40,000.

Value Computing, 498 N. Kings Highway, Cherry Hill, N.J. 08034.

SYNCSORT. INC. Syback Release 1.4

Syncsort, Inc. has introduced Re-lease 1.4 of its Syback program for backup and restore functions on IBM VM systems.

Among the enhancements reportedly made to Syback Release 1.4 are improved elapsed time and enhanced direct-access storage device and tape capabilities. Syback Release 1.4 also reportedly can run in stand-alone mode while supporting interactive console communications. It can be installed as a disconnected batch machine, which provides security and the use of a user accounting chargeback facility.

Among its disk and file features, Syback Release 1.4 is said to offer an old-date/new-date option, for use with copying duplicate operations, and automatic disk formatting capa-bility, which permits it to dynamically format the output disk.

Syback Release 1.4 is priced at \$4,150/CPU for a one-year lease and \$9,000/CPU for a three-year lease

Syncsort, 560 Sylvan Ave., Englewood Cliffs, N.J. 07632.

PARA RESEARCH, INC. Easy Report

Para Research, Inc. has announced Easy Report, a report generator for IBM System/34, 36 and 38 proces

According to a spokesman, Easy Report allows a user to utilize any file in the system to design reports and listings. For users of Para Research's accounting software, Easy Report includes 28 Para Research accounting files predocumented for ease of use. Users can design reports by answering a series of English prompts provided by the system.

Easy Report uses user input to write an IBM RPG II program, which retrieves information from data files. The resulting report can be printed or displayed on a CRT terminal, and titles and columns are automatically

Easy Report requires 38K bytes of memory and 1,000 blocks of library space. It is priced at \$750.

Para Research, 85 Eastern Ave., Gloucester, Mass. 01930.

KOLIN CORP.

Corp. has announced Kprobe, a core dump analysis tool for mainframes under IBM's VM/CMS operating environment

Kprobe enables full screen analysis of common dumps so users can view and compare several dumps si-Continued on page 68

Dream computer.



The COMPAQ DESKPRO is the fastest truly compatible desktop you can buy. It's two to three times faster than the industry standard. That saves time now. And in the future, as software becomes more sophisticated and integrated, it will save you even more time as well as protect your personal computer investment.

But there's more. We gave the COMPAQ DESKPRO one other feature not found on any other machine. You can choose between an amber or green dual-mode monitor that displays high-resolution text and graphics with equal brilliance, saving you the cost and clutter of a second monitor. See the Dream Computer. Then pinch yourself. It's for real. For the location of the nearest Authorized COMPAQ Computer Dealer, or for a free brochure, call 1-800-231-0900, Operator 5 or Telex #795437 COMPAQCOMP HOU.



Continued from page 67

multaneously, Kolin said. Central processor storage and storage from virtual machines reportedly can be examined and modified.

Users can create custom debugging macros without modifying source code and can format storage, instruction sequences and system control blocks, according to the vendor.

Kprobe costs \$1,200 and has a \$2,400 yearly maintenance option that includes upgrades and technical support.

support.
Kolin, 3064 Scott Blvd., Santa Clara, Calif. 95054.

PRODUCTIVITY AIDS

NOVA GRAPHICS INTERNATIONAL CORP. Device drivers for Nova*GKS

Nova Graphics International Corp. has announced a series of device drivers to be used with its Nova*GKS system, an application development tool that implements the international Graphical Kernel System (GKS) standard.

Among the device drivers released by Nova Graphics are the VT-100/102 for use with Digital Equipment Corp. systems; the Tektronix 4010/4014 and 4105 for Tektronix, Inc. systems; the IBM Personal Computer under PC-DOS with C binding; the Host/IEM PC for use with IBM mainframes and Personal Computer work-stations; the Tandberg Data TDV 2230S for use with Tandberg Data, Inc. systems; the Prime Host for use with Prime Computer, Inc. systems; and the Univac Host for use with Sperry Corp. systems.

The firm said the device driver prices range from \$500 to \$3,000.

Nova Graphics International, Suite J-5, 13740 Research Blvd., Austin. Texas 78750.

PANSOPHIC SYSTEMS, INC. IMS interface option to Gener/OL

Pansophic Systems, Inc. has announced an IBM IMS interface option to its Gener/OL fourth-generation programming language for on-line

program development and query.
According to a spokesman, Gener/
OL is designed for use under IBM's
CICS teleprocessing monitor. The IMS
interface option provides the capability to update, access and insert
IMS data base records. It is priced at
\$7,500 for IBM's OS environment.

Pansophic Systems, 709 Enterprise Drive, Oak Brook, Ill. 60521.

APPLICATION PACKAGES

SOFTWARE INTERNATIONAL CORP.

Version 6.3 accounts payable

Software International Corp. has introduced a new version of its accounts payable program, which features the capability to handle electronic funds transfers.

Version 6.3 of the accounts payable program also features an embedded production report writer and an alternate payment methods function. Other major features include an online input and inquiry capability and real-time vendor file maintenance.

Initial deliveries of Version 6.3 will be for mainframe computers utilizing IBM's DOS operating system.

Prices range between \$50,000 and \$60,000.

Software International, 1 Tech Drive, Andover, Mass. 01810.

HEWLETT-PACKARD CO.
HP Patient Care Management

Hewlett-Packard Co. has introduced an addition to its HP Health-care Information System. HP Patient Care Management automates patient admissions, transfers, discharges, order entry and communications. It runs on the HP 3000 using standard terminals or on the HP 150 touch-screen personal computer acting as a terminal.

During the admission process, HP Patient Care Management allows col-

lection of demographic, clinical and financial data on inpatients and outpatients. The system also can be used to gather information and order tests and procedures prior to admission. The system displays an up-to-date status of all hospital beds to facilitate bed assignment, the vendor said. HP Patient Care Management has

HP Patient Care Management has a base price of \$120,000 for software and \$450,000 for hardware, including a computer, disk drives and terminals

Hewlett-Packard, Medical Products Group, 3000 Minuteman Road, Andover, Mass. 01810.

DATATREND, INC. Datacalc Version 3

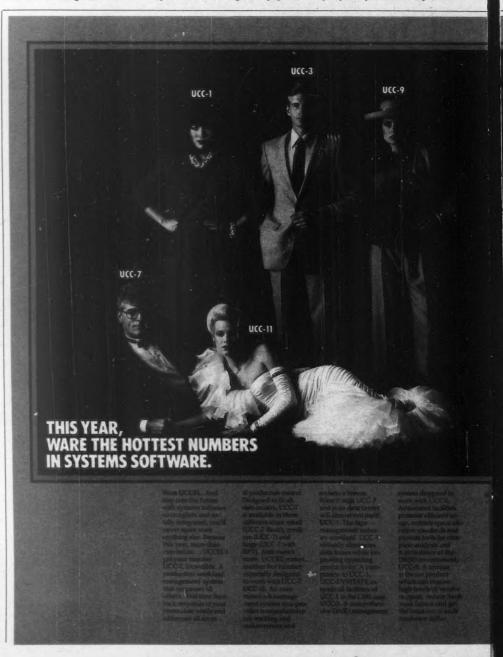
Datatrend, Inc. has announced Version 3 of its Datacalc electronic spreadsheet for Digital Equipment

Corp. VAX-11 superminicomputers in the DEC VMS environment.

According to a spokesman, a significant portion of the enhanced release has been written in VAX-11 native-mode assembly language to improve performance for time-critical operations. Calculations reportedly are 10 times faster than in previous versions. Other features include an index of saved spreadsheets and columns and rows that can be sorted in ascending or descending order or moved to new locations.

moved to new locations.

The spokesman said Datacalc spreadsheets are "three-dimensional," meaning that active spreadsheets can retrieve data from other spreadsheets. An automatic consolidation feature has been added to Version 3 for consolidating several spreadsheets into one, and an on-line help capability has been implement-



ed to provide help text at every level.

Other enhancements include new function and display formats, including hidden columns and floating dollar signs.

Version 3 of Datacalc costs \$1,795. Datatrend, 395 Ironwood Drive, Salt Lake City, Utah 84115.

HEWLETT-PACKARD CO. HP 79001CS

Hewlett-Packard Co. has announced a hospital financial management software application designed to run on its HP 3000 line.

According to a spokesman, the HP 79001CS hospital financial management application is a part of HP's Healthcare Information System, which is designed to provide clinical, financial and administrative information to a medical facility. The ap-

plication is said to offer hospitals complete access to financial information on-line in any report format desired.

The application reportedly creates a data dictionary that allows the user to extract information in the format desired. It also provides for real-time processing of data. The system offers comprehensive case-mix management, medical records applications and extensive management report-

ing.
The HP 79001CS is priced between \$100,000 and \$450,000, depending on configuration.

Hewlett-Packard, 3000 Hanover St., Palo Alto, Calif. 94304.

SOFTWARE 2000, INC.

Software 2000, Inc. has announced

the GL 2000 general ledger system for the IBM System/38. The product can be used to create Lotus Development Corp. 1-2-3 spreadsheets from GL 2000 data.

The system provides a 36-char, free-format account number that can be broken into nine segments such as company, division, cost center, account and subaccount. The user defines the number of characters assigned to each segment and the name of the segment. Each company in the system can have a unique structure.

Two report writers are available with the GL 2000. The product also features dynamic split-screen menus; multiple-window screens; four-tier help text at the field, screen, function and command-key levels; subfile lookup and select; field-level security, lockable menus; user-specified printer controls; on-line printed doc-

umentation; and a data dictionary.

The one-time license fee for the GL 2000 is \$22,000.

Software 2000, 64 Enterprise Road, Hyannis, Mass. 02601.

ISSCO GRAPHICS Tables

Issco Graphics has announced an option to its Tell-A-Graf graphics software that reportedly allows users to report numbers, words and symbols in organized, tabular format.

According to a spokesman, the Tables option allows Tell-A-Graf users to display data simultaneously in both tabular and graphics form.

Tables draws upon Tell-A-Graf data files to convert charted information to tabular form. The software also incorporates Issco's The Data Connection software so that users can directly access data files, manipulate data and display the results in tabular format.

Features of the Tables option include calculating data for total, difference, average and median and printing the results; creating tables with complete labeling; intermixing numeric tables with text columns and using symbols; and controlling character appearance, table borders, content position, underlining and background color.

The spokesman said versions of

The spokesman said versions of Tell-A-Graf are available to operate on most mainframes and minicomputers. The Tables option is priced between \$1,000 and \$10,800, depending on host environment.

Issco, 10505 Sorrento Valley

Issco, 10505 Sorrento Valley Road, San Diego, Calif. 92121.

ARETE SYSTEMS CORP. Osap software

Arete Systems Corp. has added several software products to its Open Software Architecture Program (Osap) software for its Unix System V-based systems.

One of the Osap software offerings is PC Works from Touchtone Software Corp., which allows Arete users to communicate with IBM Personal Computer networks under Arix, Arete's proprietary Unix System V. Also included are Unify Corp.'s Unify, a relational data base management system; Real World Software, Inc.'s MBSI, an integrated account." package; and Silicon Valley Software, Inc.'s SVS Pascal, SVS Fortran and SVS Xbasic.

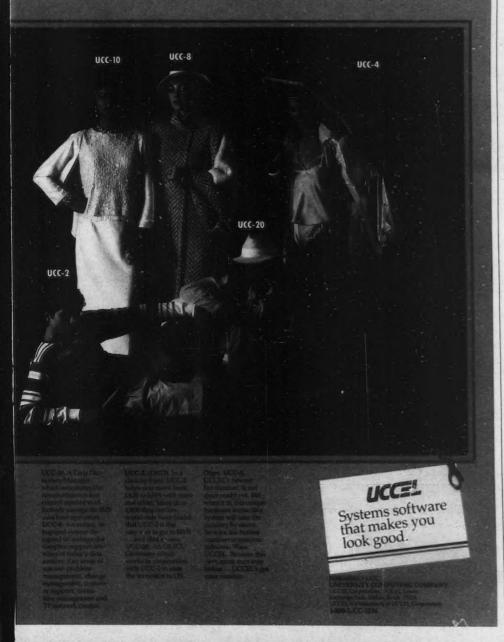
In addition, Arete is offering its own C compiler and Ryan-McFarland Corp.'s RM/Cobol and RM/Fortran. Also included are Software Innovations, Inc.'s AVI., a C-style language; and Plus Five Computer Services' Mumps language.

They are offered at the following prices: PC Works, \$495; Unify, \$1,500; MBSI, \$4,520; SVS Pascal, \$2,100; SVS Fortran, \$2,100; SVS Kbasic, \$3,100; Arete's C compiler, \$700; RM/Fortran, \$1,250; RM/Cobl, offered in a Cobol runtime-only version, \$450; AVL, \$1,200 for 16 users; and Mumps, \$5,000 to \$10,000, depending on the number of users.

depending on the number of users. Arete Systems, 2040 Hartog Drive, San Jose, Calif. 95131.

PARK SOFTWARE, INC.

Park Software, Inc. has introduced a report writer and query system for Digital Equipment Corp.'s VAX-11 Continued on page 72



Software International Understands That Human Resource Management



That's why Software International Financial and Personnel

Requires a Special Touch.

Introducing the Software International Payroll/Human Resource Management System. The true on-line, real-time system that outs you in control.

Imagine: ... human resource capabilities for compliance reporting, safary and berreits administration, applicant tracking position control, manpower planning and development, "what if" modeling and much more.

Then, discover the payroll module for direct terminal-based control over paycheck processing, tax changes, establishment of new earnings types plus deductions and reports. You have access to all or line information through an easy-to-line information through an easy-to-line information and provided in the payroll of the

Access to sensitive human resource and payrell information is controlled by one of the industry's most advanced data security subsystems.

The Payroll/Human Resource
Management System is just one of
the advanced financial and human
resource management software
packages available from Software
International. We have nearly two
decades of experience in doing one
thing with exceptional expertise:
providing better applications
software for mainframe and
minicomputers.

When human resource professionals want to run better, they run with us.

Call or write:
Software International Corporation.
One Tech Drive
Andover, MA 01810
1-800-343-4133
In Massachusetts 1-800-322-0491.

Software International is a wholly-owned subsidiary



SOFTWARE INTERNATIONAL

Software Packages are running in over 5000 installations.

Run With Us

INTEGRATED SYSTEMS

There is only one conference & exposition dedicated totally to integrated information systems. Be There.

DALLAS OCT. 8, 9, 10, 11

INTECH

National Trade Productions, Inc.
2111 Fisenhouser Ave. Alexandria VA 22314





formats information from any application package using DEC's RMS operating system on a VAX-11 computer, according to a vendor spokesman.

Mentis creates command files so that all responses to a session may be saved for later use, the vendor spokesman said.

Its Save Selected Records function puts the address of selected data records into a file for later retrieval by either Mentis or a user-written program, the spokesman commented.

SOFTWARE & SERVICES

Other features include format control; multilevel security; conditional calculations; and logical, arithmetic and comparison operations, according to the vendor.

cording to the vendor.

The Mentis data dictionary feature was designed to accommodate Park's data management products, according to the spokesman for

the vendor.

Available options include a file/record generation capability and interfaces to a variety of word processing and spreadsheet/financial modeling packages, according to the company spokesman.

Prices range from \$4,000 to \$7,000, according to the spokesman for Park Soft-

Park Software, P.O. Box 202, Northgate Station, Seattle, Wash. 98125.

SOFT PRO SYSTEMS, INC. Purchasing System

Soft Pro Systems, Inc. has introduced a purchasing program for use with the Wang Laboratories, Inc. VS operating system.

The Purchasing System is said to provide managers with reporting and analysis of their purchase order systems. The program includes three subsystems: purchase order, packing slip and invoice, the vendor said.

The three subsystems reportedly keep track of purchase orders, packing slips and invoices through their various stages to provide onorder information, give the receiving status of an order, provide average price information to inventory, report accounts payable information for vendor payment and produce information for management analysis.

The package is priced at \$5,000/CPU.

Soft Pro Systems, 4121 MacDonald Ave., Richmond, Calif. 94805.

GLOBAL SOFTWARE, INC. Hospital Cost Control

Global Software, Inc. has announced a cost accounting software package to help hospital administrators control Medicare costs. Designed in response to the federal government's Prospective Payment System, the Hospital Cost Control System (HCCS) operates under IBM'S CICS operating system on IBM 30 and 4300 series and plug-compatible mainframes.

HCCS organizes and analyzes diagnostic-related grouping (DRG) costs. Each DRG profile in the HCCS contains line items for professional services, laboratory tests, supplies and other items, the vendor said.

Functions include actual cost variance analysis, gross revenue accounting, profitability analysis, financial modeling and forecasting and trend analysis. HCCS also contains its own hospital ledger and report generator.

ger and report generator.

The price of HCCS ranges from \$75,000 to \$150,000, depending on host system hardware.

Global Software, P.O. Box 51248, 1009 Spring Forest Road, Raleigh, N.C. 27609.



THE PRINTER TO PICK WHEN THE PACE QUICKENS.

It's happening all over the PC and micro worlds. You're getting hit with a ton of increased throughput rour applications are generating a deluge of paper. You need more printer speed. A lot more.

You're also looking for more professional-looking presentations so you need better print quality. A lot better. Who's got the best of both worlds for you?

Okidata's Pacemark 2350 and 2410 dot matrix printers They'll not only help you keep pace with your world, they'll help you set new and exciting ones. In print speed. In print quality. And in vastly increased compatibility and capability.

Take throughput. The 2350 and 2410 can quickly get you out of the waiting game to where you're really cranking it out. And with flexibility, too: up to 5 pages per minute.

But wait. Cranking what out, you may ask? A single, restrictive printing mode? No way. The 2410 can give you DP, draft, and a correspondence quality that truly rivals the daisywheel.

. And the 2350 and 2410 can both print at up to 350 cps. While producing 120 to 420 lines a minute for you. With bidirectional printing and short line seeking logic. And both high speed horizontal and vertical slew.

PC COMPATIBILITY. SOFTWARE COMPATIBILITY.

The 2350 and 2410 use industry standard interfaces making them hardware compatible with most mini and microsystems on the market today. In addition, they are

supported on the menus of most of the important software being offered to microsystem users like VisiCalc*, Lotus** 12-3**, dBASE II*, Peachtree 500** and General Ledger, Multimate*, WordStar*, etcetera, etcetera.

But wait, there's more. Like an outstanding all points addressable graphics capability with 144 x 144 dots per inch resolution

Two color printing for highlighting. Down line loadable font sets for flexibility. Subscripts and superscripts so your scientific and technical usage won't bog down. Sixpart forms handling. The capability to print 132 columns on eight-inch paper using 17.1 characters per inch to save paper costs and make output easier to handle.

And—so that you can depend of getting all that good stuff, all the time—a mean time between failure of 2200 hours. A mean time to repair of only 30 minutes. An average printhead life of 200,000,000 characters.

No doubt about it, the quicker the pace at your place, the more you need Pacemark from our place. For more information, call toll free 1-800-OKIDATA.

In New Jersey, 609-235-2600 Or write OKIDATA, Mt. Laurel, NJ 08054.



OKIDATA an OKI AMERICA COMPANY

We're keeping pace with your business.

SOFTWARE & SERVICES

SIGMA CONSULTING GROUP Maintenance software program

Sigma Consulting Group has introduced a modular maintenance soft-ware package for facility and plant equipment maintenance

The program reportedly runs on any microcomputer or minicomputer using the Pick & Associates, Inc. Pick operating system

It includes modular elements such as work order control, equipment history, preventive maintenance, parts inventory control and cost and management information reporting.

The cost of the system with all five elements is \$40,000.

Sigma Consulting Group, Suite 104, 12465 Lewis St., Garden Grove, Calif. 92640.

FOUR-PHASE SYSTEMS, INC. Electronic Mail System/IV; Electronic Worksheet System/IV

Four-Phase Systems, Inc. recently introduced a menu-driven electronic mail software package and an integrated spreadsheet program for use with the company's 4000 and 5000

computer systems.
Electronic Mail System/IV (EMS/ IV) can transmit notes and packages of text or system files to any user within the electronic mail network, the company said. Based on a sharedresource network architecture, EMS/ IV allows independent 4000 and 5000 systems to send and receive Four-Phase's Foreword word processing files, control and source files, compiled Cobol and assembler absolutes and any file stored in the firm's Interrupt Disc Operating System.

The Electronic Worksheet System/ IV (EWS/IV) is a menu-driven, multi-workstation tool that operates with all other Four-Phase Multi Function Executive 4000 and 5000 software applications, the vendor said. The program reportedly accepts English-like commands and lets users revise and analyze data and mail it electrically to other users

Business applications include fore-casting, planning, sales projections, expense reports, financial analysis of income statements, balance sheets and job costs, budgeting and statistical analysis, the vendor said.

A permanent license for EMS/IV is available for \$1,000 per system processor. The one-time licensing fee for EWS/IV is \$1.500.

Four-Phase Systems, 10700 N. De Anza Blvd., Cupertino, Calif. 95014.

PLEXUS COMPUTERS, INC. Software Referral Catalog

Pléxus Computers, Inc. recently released the "Plexus Software Refer-ral Catalog," which lists more than 150 Unix application software packages currently available for the company's Unix-based supermicrocomputers.

Packages include high-level language compilation, data base management, word processing, spreadsheets, text editing, general accounting and financial analysis, communications, application generators, business graphics, statistics and math, menu and system management and numerous utilities and vertical applications.

The catalog is available free of charge, according to a spokesman for

Plexus Computers, 2230 Martin Ave., Santa Clara, Calif. 95050.

SYSTEM SOFTWARE ASSOCIATES, INC. **BPCS Process Manufacturing**

System Software Associates, Inc. has announced a process manufacturing package for use on the IBM System/36 in industries such as pharmaceuticals, chemicals, food processing and medical equipment. The BPCS Process Manufacturing

Software is said to contain features designed to handle lot control and traceability requirements, expiration of lots, potency, quarantine, inspec-

tion, batch bills and yield analyses.

Modules include inventory management, production activity control, purchasing, bill of materials process-ing, material requirements planning, capacity planning and batch and product costing.

Available now, the package costs \$30,000 with source code and documentation.

System Software Associates, 200 W. Madison, Chicago, Ill. 60606.

RECOGNITION CONCEPTS, INC. **Fast Fourier Transform**

Recognition Concepts, Inc. (RCI) has announced software designed to perform fast Fourier transforms on variable image arrays of up to 2,048 by 2,048 32-bit pixels. Fast Fourier Transform is designed for the Vector Pixel Processor option to RCI's Trapix 5500 system.

It performs forward and inverse two-dimensional Fourier transform and includes modules for frequency domain weighting and filtering as well as power spectral density com-putation and display, according to

the vendor. Execution time for a twodimensional fast Fourier transform over a 1,024- by 1,024-pixel array is said to be approximately 25 seconds.

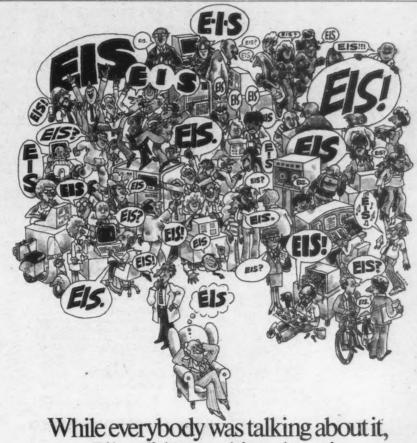
The price of Fast Fourier Transform is \$1,200.

Recognition Concepts, 924 Incline Way, P.O. Box 8510, Incline Village, Nev. 89450.

EXECUTIVE TECHNOLOGY DATA SYSTEMS, INC. mall Business Accounting

Executive Technology Data Sys-Inc. (ETDS) has announced Small Business Accounting, a new re-lease of its client accounting system for certified public accountants, designed for IBM System/34 and 36 minicomputers.

The system includes several new Continued on page 74



Pilot did something about it. Pilot Executive Software FOR INFORMATION ON announces the first mainframe THE MOST ADVANCED

Executive Information System (EIS). Designed to increase the effectiveness of your company's computers at the executive level, Pilot's EIS provides managers with the type of on-line reports they've been asking for. "Status

EXECUTIVE SOFTWARE CALL PILOT AT 617-523-5355.

access" for major business ele ments. Financial reports. Sales tracking. Plus other internal and external report formats and func-

tions never before available on a distributed system. The Pilot EIS runs on standard mainframes accessed by the IBM PC. The system gives you control over data, yet allows managers to review and analyze by menu. Call today for more information. And find out for yourself what all the talk is about.



EXECUTIVE SOFTWARE

ED STATE STREET BOSTON, MASSACHUSETTS 02109

SOFTWARE & SERVICES

ued from page 73

features, including a quick client setup procedure and an automated working trial balance subsystem

The system is priced at \$7,500 on the System/34 and \$8,500 on the Sys-

ETDS, Suite 108, 28104 Orchard Lake Road, Farmington Hills, Mich.

LANGUAGES

RAPITECH SYSTEMS, INC. Fortrix-C

Rapitech Systems, Inc. has announced the Fortrix-C package for users of the Unix operating system and the C programming language.

According to a spokesman, For-

trix-C converts Fortran language programs and files to C code. It is said to be configured to meet the requirements of a variety of Unix environments and includes integer-character string converters, space allocators string parsers and other string manipulators. In operation, Fortrix-C converts Fortran flow control statements to functionally equivalent sets of C instructions

Read/write field widths are re-tained, and the C code spacing requirements are exactly those of the parent Fortran program. Output streams for both the original and the new code reportedly look the same.

Fortrix-C executes at a typical conversion rate of 600 lines of code/ min, the spokesman said.

Fortrix-C is priced at \$2,500.
Rapitech Systems, 565 Fifth Ave.

New York, N.Y. 10017.

MOTIVATE from page 55

is a visit to another data processing shop. Ideally, it should be a company in the same industry. But in any case, the value is maximized when both companies are using the same or similar hardware and software.

■ In-house communications. Brainstorming sessions to attack specific problem areas or to produce ideas for improved productivity can be rewarding for the company as well as for the employees. Presentations by the staff on projects or new techniques not only provide for shared information, but also help employe develop their communication skills. If the software people take a regular coffee break together, I suspect their conversations usually turn toward work, and some of the best communication occurs during these times.

Publications. The manager should see that the staff has access to some of the better computer publications on a current basis. Employees also need to be allowed the time to read such periodicals. Many good publications are free. Others carry only a nominal cost

Do not, in either case, limit the number of circulated copies so that the issues are weeks old before an individual sees them. These ideas cost time and money. But they are an in-vestment in the future of the information systems organization as well as in the company itself.

By allowing analysts and programmers to expand their knowledge and to be exposed to new ways of doing things, this plan will increase the employees' productivity. Additionally, they will become better business-

Data Tesign's Financial Software

l'his Bu

Is that what the developer of your brand new financial software system apparently assumed when he sold it to you? That you would have to be the one to discover the bugs in the system?

It doesn't have to be that way. Finance and accounting managers at hundreds of major corpora-tions have found they can rely on the financial soft-ware systems by Data Design.

Why? Our Financial Applications Software ackages—all of which are developed by Data Design are given the most extensive reliability testing in the industry, guaranteeing ease of use and trouble-free installation.

No wonder, then, that Data Design was rated so highly in the latest *Datamation* software survey. In fact, in the ratings of General Accounting packages Data Design's Fixed Assets and Accounts Payable/ Purchase Control finished above all other packages studied. Ahead of MSA, McCormack & Dodge and Software International. Our General Ledger and Capital Project Management System were too new to be included in the survey. We're dedicated to achieving same results with these systems

Data Design was rated higher in terms of overall satisfaction with product performance as well as service and support. The service and support ratings are especially significant in that they polled user votes in the categories of vendor responsiveness, training and documentation—areas critical to trouble-free system operation. Data Design has consistently been rated the best in these categories in nationally recognized independent software surveys.

Follow-up maintenance (each customer is assigned their own personal Account Manager), telephone consultation and a 24 hour emergency hot-line service are included with the purchase of each system. So are full installation assistance and in-depth training (at Data Design or at your facility).

So you see, our reputation for excellence has been built on providing only the highest quality mainfram software for:

- General Ledger Financial Control Accounts Payable/Purchase Control
- ☐ Fixed Asset Accounting ☐ Capital Project Management

To learn how these systems work for a broad range of medium to large size companies on most major computer systems, call today at 800-556-5511 (408-730-0100 in California), or complete and mail the



1279 Oakmead Parkway, Sunnyvale, CA 94086

Please send me additional General Ledger System Accounts Payable P tur Fixed Asset Accounting Capital Project Manage My need is: I mmediate I am interested in atter	chase Control System
Name :	
Title	STATE STATE OF THE STATE OF
.Company	
Address	
City, State, Zip	
Telephone()	
Computer Brand	Model
- GREENSE	CWD4

R&D from page 55

company with a stable and focused business plan can end up with a series of income statements that weave like the path of a drunken sailor.

Furthermore, with no assets against which to borrow and no measurable revenues, these companies can look like so many hot potatoes to potential investors.

Naturally, many companies would prefer to treat the costs of developing a software product as an asset. This would allow them to depreciate the costs over several years and would make their balance sheets look more attractive.

However, this approach also harbors many hazards. Since software products have usable life spans ranging from two to 20 years, it is virtually impossible to develop capitaliza-tion guidelines that will be acceptable to everyone. In fact, it was abuses of those very procedures that led the Securities and Exchange Commission last year to ban temporarily the practice of capitalizing software costs unless a company had already been doing so.

However, the rules may be chang-ing soon. The Financial Accounting Standards Board, which sets ac-counting industry rules, has taken the capitalization/expense controversy under consideration. Later this month, a working group within the board is expected to release an "exposure draft" on its recommendaposure draft" on its recommenda-tions and conclusions to date. If the board accepts it, the draft document will go out for public review, which offers companies a chance to comment on this controversial rule. Price Waterhouse is trying to stir up interest in the debate by releasing a survey it conducted of the accounting practices of 24 major software firms.

The study looks at how the companies recognize revenues and deal with R&D expenses. It also looks at some of the tax consequences of various approaches. Not surprisingly, the report also includes a hefty plug for Price Waterhouse services. N theless, it is useful background.

Price Waterhouse is urging software companies and investors to make their feelings known on this issue. MacKinnon said the best way is to write to the Financial Accounting Standards Board or talk to your independent accountant.

A free copy of Price Waterhouse's report can be obtained from the firm, which is located at One Federal St., Boston, Mass. 02110.

Satellite service to target private-line mart

By John Dix

MOUNTAIN VIEW, Calif. - A low-cost, two-way digital satellite service will be made available later this year to users who operate large transaction-oriented networks, if all goes according to the plans of a company here.

Communications Co Us Co., founded in 1979, presently provides a point-to-multipoint, one-way information delivery service via satellite. Companies use the service to dis-tribute things like news or financial and commodities data. In July, the \$18 million company reported the installation of its 15,000-user earth station.

Now Equatorial has set its sights on the \$6 billion private-line market and is readying a two-way digital satellite communications service targeted at users in the Fortune 200 companies that operate networks with 500 or more drops. Six companies are presently testing the service — which is slated to be generally available in the fourth quarter of this year - including

Citibank in New York and Niagara Mohawk Power Corp. in upstate New York.

Equatorial's two-way service is geared to transaction processing applications used by many industries, including insurance, banking and retailing, according to

Philip L. Arst, Equatorial's director of marketing. By nature, transaction processing data traffic is typically point-to-multipoint — users from many locations access

ing a central data base — and asymmetri-cal, with a user's data base inquiry being 40 to 50 characters and the response consisting of 400 to 500 characters, Arst said.

To meet the particular needs of this application, Equatorial has developed a system whereby users connect their centralized data base to Equatorial's master antenna and distribute 4-ft micro earth stations to remote sites that need to access that storage vault.

The remote locations use the micro earth stations to beam inquiries up to the satellite, where they are bounced back down to Equatorial's master antenna and then relayed to the data base. The response to the query is handled in a similar manner. Reflecting the lopsided data flow typical of transaction processing, inbound inquiries are usually transmitted to the data base at 1,200 bit/sec, and outbound responses are broadcast at 19.2K bit/sec.

The location of the user's data base, according to Arst, is inconsequential. "A cross-country line is about \$3,000, or twice that for two lines, but if you are dividing that cost by a thousand user locations in the field, then it is negligible."

Multiple access to the centralized re-source is provided to the individual micro earth stations with a technique called code division multiplexing, whereby each station is identified by a several thousand bit code. This prevents one station from interfering with another, according to Arst.

The company also uses this type of addressing to provide point-to-point commu nications between remote micro earth stations, with the master antenna acting as a switch. This requires a double hop - from

See SATELLITE page 80

INSIDE

Controllers/76

Voice/Data Communications/77

Protocol

Converters/77

Software/77 Multiplexers/

Modems/78 Auxiliary Equipment/78

to be put through the paces

While the use of Equatorial Communications Co.'s satellite communications system is expected to save Citibank money, the company expects that the real value of the system will be realized in the creation of new business opportunities.

Citibank in New York City and Niagara Mohawk Power Corp. of Syracuse, N.Y., are two of six companies presently testing Equatorial's two-way satellite service, slated for commercial availability by the end of the year.

Charles Baber, manager of engineering development at Citi-bank, reported that his company will have 10 to 20 Equatorial micro earth stations installed by the end of the year. One test site is operational.

The bank intends to use the system between branches initially to meet the inquiry response needs of a personal or direct lending application. Under the second phase of installation, expected to commence next year, 150 more micro earth stations will be installed.

"With this type of network, the problems you have to deal with are more administrative than technical," Baber said. "To do See PACES page 80

Equatorial's satellite network Spread-spectrum technology at core of satellite service

Equatorial Communications Co.'s satellite services are made possible by a technological spin-off of radio astronomy that the company patented.

The so-called spread-spectrum technology enables Equatorial to use the small, inexpensive 2-ft earth stations in its one-way service and 4-ft stations in its two-way ser-

In domestic satellite communications, typically a bit (1 or 0) is represented by a single signal element such as a shift in frequency

With the new technology, a bit is stretched out and represent-ed by 100 signal elements called a chip. This gives the small earth stations 100 chances to decide if what they are receiving is a 1 or

Beside being less expensive, the small antennae make it easier for users to hide the dishes behind rooftop obstructions like elevator shafts to mitigate interference problems.

Equatorial's satellite system, like most domestic communications satellites and terrestrial microwave systems, uses radio frequencies in the 4- to 6-GHz range.

MCI Document Plus allows data exchange among word processors



WASHINGTON WIRE

major shortcoming of public electronic message networks that enable word processing devices to communicate, is their inability to compensate for differences in the way various machines handle text commands

These codes are used to define how text processing devices provide for things like underlined text, boldface characters and other similar features. Every manufacturer implements different codes to repre sent the same text-processing com-

Until recently, none of the commercial networks have provided a

way of converting from one code to another. But now MCI Digital Infor-mation Services Corp., a subsidiary of MCI Communications Corp., is marketing a service that reportedly enables textual information to be exchanged between seven brands of word processors in the form in which it was originated.

According to Vinton Cerf, vicepresident of engineering for the MCI subsidiary, the new service, called Document Plus, enables documents to be communicated between word processors from CPT Corp.; Digital Equipment Corp.; IBM; Lanier Business Products, Inc.; NBI, Inc.; Wang Laboratories, Inc.; and Xerox Corp These machines, he said, represent 85% to 90% of the communicating word processors now in use. Cerf

also said that early next year, MCI plans to extend its new service to personal computers that have word processing capability.

Document Plus is available only to users of MCI Mail, the company's electronic messaging service, and costs the customer an additional \$20 per month. Cerf expects it to be particularly useful to those who need extensive text-processing capabilities, such as lawyers, engiers and doctors.

In addition to accompanying textual commands, the new service handles irregular spacing, irregular indentation and column formatting instructions.

lifies editing chores

It also makes the recipient's editing chores easier, since codes defining each component of the transmitted document - paragraphs, headers, footnotes and page num bers, for example - are accepted by the receiving machine.

The Document Plus conversion is performed by the RTI 404 microprocessor, developed by Racal Tele systems, Inc. (RTI) of Chicago. Each network node through which MCI Mail Service is provided has a set of 404s; a separate one interfaces with each make of communicating word processor served.

The 404s convert the text-processing codes of incoming me to a standardized code, which the company calls Racal Normal Form, in which it remains while stored in the recipient's electronic mailbox. When called for, the message is converted by another 404 into the code used by the receiver's word proces-

Firms develop video meeting system for IBM network

HARTFORD, Conn. — Two companies have developed a video teleconferencing system that can be integrated into a user's IBM network to take advantage of existing communications facilities.

cations facilities.

Developed jointly by the Travelers Corp. of Hartford, Conn., and American Video Teleconferencing Corp. of Oceanside, N.Y., Inforum is a slow scan video meeting system that uses an IBM Systems Network Architecture (SNA) network as the distribution vehicle for photographic and computer-generated images.

Because the system uses communi-

Because the system uses communications lines that operate at 9,600 bit/sec or 19.2K bit/sec and are presumably already part of an SNA network, it is estimated that Inforum can be used at one-tenth of the recurring cost of a full-motion video teleconferencing system.

Inforum facilities include proprietary bridging software, an IBM Personal Computer and associated software, a proprietary communications controller, room controller and standard audio and video communications equipment.

The bridging host software runs on IBM 3080 series machines and operates in single- or cross-domain SNA environments. The software supports up to 10 concurrent sessions with remote sites that have IBM 3705 or 3725 front-end processors.

The communications controller is

said to be the hub of the system; it physically and logically connects the other system components. The room controller is microprocessor-based and, through a flat panel control screen, guides use of the system with menus. All functions relating to conference setup emanate from the room controller.

The use of the Personal Computer comes into play with a proprietary software package called Decision Images. This package enables the offline creation of text, graphs, spreadsheets and user-created drawings in a single screen frame. During the conference, this information can be displayed using the Personal Computer in the teleconference room and dis-

tributed to all participating locations in less than five minutes.

The Personal Computer can display spreadsheets with 12 columns and 20 rows, the parameters of which can be changed during a session and the recalculations distributed to the other locations.

The service does not accommodate audio conferencing, necessitating separate telephone connections to each conference location.

Conference rooms, with associated hardware and software, can cost up to \$150.000 to outfit.

More information on the system is available from American Video Teleconferencing at 2949 Long Beach Road, Oceanside, N.Y. 11572.

AT&T proposes teleconferencing service to FCC

BEDMINSTER, N.J. — AT&T Communications recently proposed an audio and graphics teleconferencing service that would enable users to bring together up to 59 locations to a central hub or bridge.

central hub or bridge.

In a tariff filing with the Federal
Communications Commission, AT&T
called the service the Alliance Teleconference Bridge. The service is
scheduled to be up by Sept. 16.

The system calls for the establishment of bridge sites in Chicago, Dalas, Los Angeles and White Plains, N.Y. To initiate a conference, a user would select the type of call — audio only, graphics only or audio/graphics — and establish a contact with the appropriate bridge. Once this is made, other locations would be added to the bridge simply by dialing.

Locations can be dropped, added or re-added to a conference at any time. The service provides audio support and data speeds of 4.800 bit/sec

port and data speeds of 4,800 bit/sec. The service is billed using standard long-distance rates, with each leg being charged for its connection to the bridge. There is also a per-minute usage fee charged for each bridge connection.

More information is available from AT&T Communications in Bedminster. N.J. 07921.

COMMUNICATIONS CONTROLLERS

ABLE COMPUTER, INC. VMZ/32N; DH/DM

Able Computer, Inc. has announced price reductions for two of its Digital Equipment Corp.-compatible controllers, the VMZ/32N and the DH/DM. Previously priced at \$3,750, they are now \$3,250 each.

The VMZ/32N is a communications multiplexer for DEC VAX-11 computers under VMS. It reportedly provides 16 asynchronous communications lines that can be programmed independently and offers full modem control. It also reportedly requires only half the space and bus loading Continued on page 77

There are always more channels than users on your ROLM® CBX II business communication system. (Our ten-thousand-user system has more than twenty-three thousand channels to handle voice and data.) No

And, thanks to its parallel bus and about 4½ billion bits per second system bandwidth, the CBX II lets you

blocking at any time. Ever.

OUR BUS WON'T GET STUCK IN TRAFFIC. EVER.

network a whole company full of common digital critters — telephones and terminals — plus all the latest high-performance devices: PCs, word processors, graphics terminals and computers.

You can even network networks.

On one system.

ROLM can deliver voice and data to the desk at speeds well beyond the much-discussed 56Kbps. CBX II's advanced architecture gives you hundreds of kilobits, using existing telephone wire;

d from page 76

of its DEC counterparts.

The DH/DM reportedly connects any DEC PDP-11 Unibus system to 16 asynchronous communications lines and offers modem control and direct

memory access output on all lines.

Able Computer, 1732 Reynolds
Ave., Irvine, Calif. 92714.

VOICE/DATA COMMUNICATIONS

METAPATH, INC. Robin Centralized Modular Data PABX Model 5580

Metapath. Inc. has announced a data switch that is said to be capable of addressing up to 64 serial and 16 parallel ports and linking dissimilar

computer systems, terminals and peripherals

The Robin Centralized Modular Data PABX Model 5580 (CMDP-5580) is intended for high-density computer room operations. The unit houses 16 modules, each containing four RS-232C ports and an optional parallel port, for a total of 80 ports

The CMDP-5580 is said to allow printer sharing and modem pooling in addition to mainframe interconnection for both synchronous and asynchronous systems

Each 5580 contains 16 Zilog, Inc. Z80 microprocessors, 1M byte of on-board user memory, 32K bytes of nonvolatile control memory and configuration control.

Prices are said to average about \$240 per port.

Metapath, 737 Lincoln Centre Drive, Foster City, Calif. 94404.

OCTEL COMMUNICATIONS

Aspen enl

Octel Communications Corp. has announced an enhancement to the Automatic Speech Exchange Net-work (Aspen) voice message system that increases the system's port capacity from 16 to 24.

The Aspen voice message system can, according to the vendor, be used with any private branch exchange (PBX) and can also be used with any Centrex system. The four-port system can serve from 100 to 250 users, while the largest system will support from 1,500 to 3,000 users.

User features include: voice mail (subscriber-to-subscriber), telephone answering, sending and delivery options, message review and processing features, message notifications and

full voice prompting, the company said.

The 24-port system costs \$145,000, while the 16-port system costs \$135,000, the vendor said.

Octel Communications, Zanker Road, San Jose, Calif. 95112.

PROTOCOL CONVERTERS

INNOVATIVE ELECTRONICS, MC 800

Innovative Electronics, Inc. recently introduced a protocol convert-er that allows up to 32 asynchronous Ascii devices to communicate with host computers using either Systems Network Architecture/Synchronous Data Link Control or Binary Synchronous Communications protocols.

Many remote terminals, connected via asynchronous modems, can time share a single MC 800 at the main computer site. Any mixture of CRT terminals and printers may be attached, with the unit providing auto-matic speed detection.

The MC 800 comes in nine configu-

rations from five to 32 ports and is said to support more than 100 different types of asynchronous terminals, including color tubes, teleprinters and personal computers. Price for the five-port unit is \$3,600.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

INNOVATIVE ELECTRONICS, MC-80/602

Innovative Electronics, Inc. has announced a communications proces sor designed to convert an asynchronous Ascii host into an IBM 3270type device.

The MC-80/602 reportedly emu lates an IBM 3271, 3274-51C or 3276 communications controller in local and dial-up applications to provide IBM 3277-1, 3277-2 and 3278-2 terminal communications using Ebcdic Binary Synchronous Communications.

It is said to perform full screen mapping and provide virtual screen sizes of 480, 960 and 1,920 charac-

A switch selection reportedly en-ables the MC-80/602 to communicate with an asynchronous Ascii host for file transfer with a blocking feature built in. This is said to allow the IBM Personal Computer, Digital Equipment Corp. PDP-11/70, DEC VAX-11/ 780, Radio Shack TRS-80 and other computers to communicate locally or with a remote IBM mainframe using 3270 bisynchronous communica-

The MC-80/602 costs \$1,495. Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

SOFTWARE

CENTENNIAL COMPUTER CORP. Talon

Centennial Computer Corp. has announced Talon, a communications package for computers that run the Unix operating system. According to the vendor, Talon

supports a number of communica Continued on page 78



megabits, using other media. Try that on your favorite serial architecture.

Are the steps killing you? Take the Ramp.

CBX II is a breakthrough communications controller. It's the centerpiece for a totally digital, absolutely expandable communications system. Instead of the typical stops and

starts of expansion, CBX II lets you grow smoothly, easily and very, very costeffectively. You move up the ROLM Ramp with each new need for voice and data manage ment. And you do it all on one system.

If you want to know how fast, how far a business communications system can go, don't miss the bus.

4900 Old Ironsides Drive, M/S 626, Santa Clara, CA 95050 800-538-8154. In Alaska, California and Hawaii, call 408-986-3025

Continued from page 77 tions protocols, including asynchronous, synchronous, IBM 3270 and 3278 Binary Synchronous Communications, Systems Network Architecture, X.25 packet switching and Ethernet.

The menu-driven package is reportedly written in C. Its cost ranges from \$200 on a computer

MULTIPLEXERS/ MODEMS

RACAL-MILGO, INC. Omnimux 4, 8

Racal-Milgo, Inc. has announced two additions to its Omnimux series of statistical multiplexers. The Omnimux 4 and Omnimux 8 support up to four or eight asynchro-

other, the vendor said.

The models are said to be compatible with all multiplexers in the Omnimux series, including the Omnimux 80, 160 and 320. Both models support data speeds up to 9,600 bit/sec on all channels. Additional standard features are said to include aggregate and channel loopback, flow control and error control.

The Omnimux 4 is available now for \$1,200 a unit.

\$1,700 for the four-channel model and \$2,300 for eight channels

Racal-Milgo, 8600 N.W. 41st St., Miami, Fla. 33166.

AUXILIARY EQUIPMENT

CONNECTICUT MICROCOMPUTER, INC. er, Inc. has announced an RS-232 A-B switch with speed and parity-matching capabil-

The Ayby reportedly was designed for office and laboratory use, enabling the user of a 9.600 bit/sec terminal to switch instantly to a 1,200 or 300 bit/sec connection with different connection parities.

Ayby is said to include three female DB-25S connectors as used with RS-232: one for the 9,600 bit/sec terminal: one for a 9,600 bit/sec connection, such as a direct line to a computer; and one for a 1,200 or 300 bit/sec connection, such as a modem.

The company said a slide switch allows changing the connection from 9,600 to 1,200 or 300 bit/sec. The Ayby costs \$300. Connecticut Microcomput-

er, 36 Del Mar Drive, Brook-field, Conn. 06804.

CANOGA DATA SYSTEMS,INC. CBE-200

Canoga Data Systems, Inc. has announced a general-purpose, parallel-to-serial or se-rial-to-parallel multiplexer designed to link graphics display workstations to a host at distances as great as two kilometers.

The CBE-200 fiber-optic bus extender, which is tar-geted at computer-aided design and manufacturing, uses a direct memory access inter-face module to connect to the Digital Equipment Corp. Uni-bus and Q-bus.

It is said to communicate

at speeds up to 12M bit/sec over two fibers and to be compatible with ribbon cable off the DR11-W interface.

It costs \$2,750. Canoga Data Systems, 21218 Vanowen St., Canoga Park, Calif. 91303.

INSURANCE TECHNOLOGY CONSULTANTS Asynchron Communications Emulators

Technology Insurance Consultants has announced a series of Asynchronous Communications Emulators (ACE) that are said to enable IBM Personal Computers and compatibles to emulate Honeywell, Inc. VIP7200, VIP7301 or VIP7303 termi-VIP7200, nals.

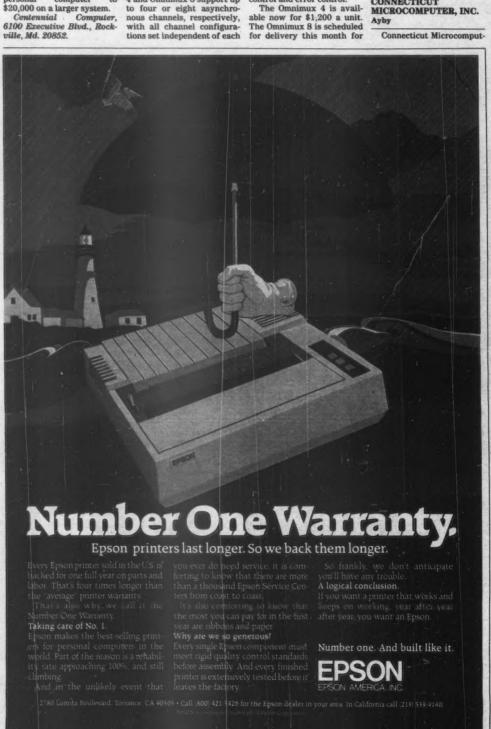
ACE uses the standard Honeywell terminal interface and functions independent of the processor and operating system, the vendor said. To use ACE, IBM Personal

Computers or compatibles must have one disk drive, 128K bytes of memory, an 80-col. display and a communications port.

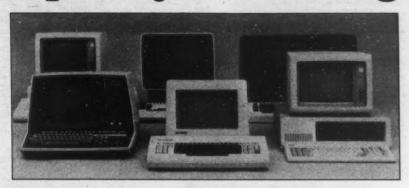
It is priced at \$295.

Insurance Technology Consultants, Suite F, 1437 W. Palmyra, Orange, Calif.

See AUXILIARY page 80



Making multi-vendor office systems work together requires just one thing.



Soft-Switch.

The idea seems simple enough: connect all of your office systems so that documents can be freely interchanged for editing, storage, display, and printing. That includes word processors, PCs running word processing packages, and mainframe terminals accessing DCF and PROFS.

Many vendors claim to connect multiple vendors' equipment through "protocol translation." And connect they can, but not communicate. To really communicate requires transforming the document coding so that it is fully editable at the receiving system.

Soft-Switch is compatibility

ITI's Soft-Switch is a program product for your IBM mainframe (MVS or VM) that allows users to send documents to other users with document translation performed automatically, to store documents in host libraries, and to retrieve documents from these libraries.

Soft-Switch communicates with IBM, Wang, Xerox, and NBI. It communicates with the MultiMate word processing program on the IBM PC, with DCF and with PROFS; with the IBM 6670 laser printer, and with standard hard copy printers.

Soft-Switch is totally consistent with evolving standards for office systems. In fact, Soft-Switch integrates multi-vendor office environments by first translating a document into IBM's level 3 Document Content Architecture (DCA), and then into the exact format required by the receiving workstation.

Soft-Switch solves today's problems

Let's say an analyst prepares a document on his PC with MultiMate. He executes Soft-Switch (which executes in the PC, as well as in the IBM host) and specifies distribution to his secretary's Wang word processor and to the 6670 laser printer down the hall. Soft-Switch provides

the micro/mainframe link, transports the document from the PC to the IBM host, translates the document from MultiMate format to DCA, translates the DCA format to Wang's WPS format and the IBM 6670 laser printer OCL format, and routes the documents to their final destinations.

Soft-Switch: a path to tomorrow

Already installed at many FORTUNE 100 companies, Soft-Switch integrates the technologies of protocol translators, text management systems, micro/mainframe links, 'message switches, and electronic mail systems to provide organizations with integrated office systems.

It's a product you need today, and will, no doubt, need even more tomorrow. To learn more about how Soft-Switch will make your multi-vendor office systems work together, just mail the coupon, or call TOLL FREE

1-800-227-3800 Ext. 7028

iti Integrated Technologies, Inc.	Mail to: Integrated Technologies, Inc 200 North Warner Road Suite 401 King of Prussia, PA 19406.
I want to know how Soft-Switch can solve	my office integration problems
☐ I'd like to see Soft-Switch at work. Please obligation demonstration.	contact me to arrange a free, n
☐ I'm not ready for a demonstration, but I'c Switch. Please see that I get the full deta Name	
	ils without cost or obligation.
Switch. Please see that I get the full deta Name	ils without cost or obligation.
Switch. Please see that I get the full deta Name Title	ils without cost or obligation. 813

AUXILIARY from page 78

ATLANTIC RESEARCH CORP. DPS-5 Data-Patch

Atlantic Research Corp. has announced a patching and switching system said to activate and monitor spare and off-line equipment.

The DPS-5 Data-Patch provides crossover switching, patching and access to both on-line and off-line circuits. The unit also can be configured to provide common A/B switching, the vendor said.

DPS-5 is said to enable the accessing, testing and monitoring of primary circuits, as well as off-line backup equipment.

The price is \$8,935.

Atlantic Research, 5390 Cherokee Ave., Alexander, Va. 22314.

ALGO, INC. Algo Message Concentrator 600

Algo, Inc. has announced its Algo Message Concentrator 600, designed to handle local and remote networking of IBM Personal Computers and compatibles with existing minicomputers and microcomputers.

It reportedly allows connection of up to 256 stations connected locally or through leased or switched telephone lines and requires an RS-232C interface and Basic I/O statements for connection.

It stores operating parameters, including a routing table; each channel's network address; data format and data rate in electrically erasable programmable read-only memory.

The Message Concentrator 600 is said to have six independent channels that operate in synchronous or asynchronous modes at speeds up to 19.2 bit/sec. A six-port unit costs approximately \$1,600.

Algo, 9198-C Red Branch Road, Columbia, Md. 21045.

LIBERTY ELECTRONICS CO. Freedom 212 Remote Information Station

Liberty Electronics Co. has announced the Freedom 212 Remote Information Station, a voice/data terminal said to combine terminal functions, data communications and telephone capabilities.

The Freedom 212 features include a tilt-and-swivel display, a 106-key keyboard with 47 programmable keys, a built-in AT&T 212A-compatible modem, a 25-number telephone directory, and an automatic dilar.

directory and an automatic dialer.
The Zilog, Inc. Z80-based device

has 8K bytes of memory and supports Ascii transmission code, the company said.

The Freedom 212 costs \$1,295. Liberty Electronics, 625 Third St., San Francisco, Calif. 94107.

INNER ACCESS CORP.

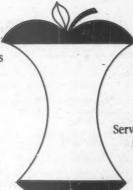
Inner Access Corp. has announced an eight-channel interface expander, 8-I/O, for use with devices built on S-100 buses. The IEEE-696-compatible card plugs into a single S-100 bus and provides eight RS-232C ports.

Up to eight of these cards reportedly can be used in any S-100 bus, providing a total of 64 channels.

The price of one card is \$695 or \$383 in quantities of more than 100. Inner Access, 517-K Marine View, Belmont, Calif. 94002.

The Big Apple Hosts The World's Largest End-User Business Computer & Communications Show

Personal Business Computers
Minicomputers
Mainframe Computers
Computer Peripherals
Work Stations/Computer
Support Furnishings
Data Communications
Voice Communications
Software



Word Processing/Records
Retention & Retrieval Systems
Electronic Mail
Microfilm Equipment
Duplicating/Copy Systems
Services (education/training, facilities management, consulting, etc.)
Computer Supplies

Plan now to join over 40,000 corporate executives and MIS/DP professionals as they explore the world's largest exhibition of business computer systems.

SEE INFO/SOFTWARE...A SHOW WITHIN A SHOW.

The Eleventh International

INFORMATION MANAGEMENT EXPOSITION & CONFERENCE

New York Coliseum - October 1-4, 1984



MAIL TODAY FOR REDUCED-RATE TICKETS!

Send Reduced Rate Tickets
Send Conference Programs.

TAME _____

COMPANY ____

STREET ____

☐ I am interested in exhibiting at INFO 84
Call me at ()

INFO 84

Cahners Exposition Group 999 Summer Street, P.O. Box 3833 Stamford, CT 06905

PACES from page 75

a coordinated installation at 20 sites takes roughly a 29-page engineering project plan, not including the individual site activity."

For its part, Niagara Mohawk is testing the Equatorial system in an energy management system.

Dr. Roosevelt Fernandes, manager of research at the upstate New York power company, reported that it is using four micro earth stations in an acceptance test scheduled to be completed by the end of next month.

"We're trying to determine the pros and cons, technical and economical feasibility of Equatorial's system" for this application, Fernandes said. Depending on the success of the first testing phase, 16 more sites will be added later. The network could potentially be used to support more than 600 remote stations.

SATELLITE from page 75

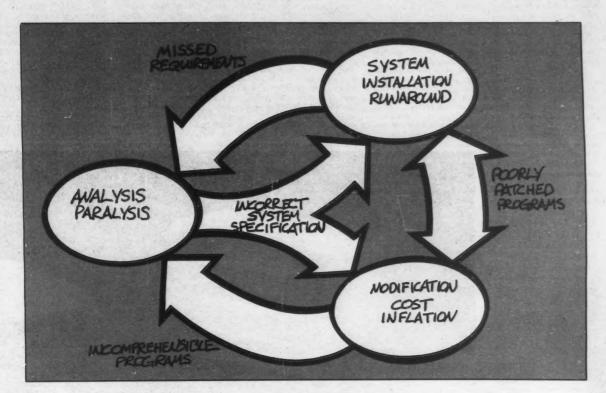
micro earth station up to the satellite, down to the master antenna and then back up and down to the other remote micro station.— that drastically increases communications delays and precludes use of the system for certain applications. Arst said that the system is de-

Arst said that the system is designed to be transparent to the user and not require any software modification. When interfaced to an IBM Systems Network Architecture (SNA) network, for example, the service provides level two data link functions and appears to a user's IBM 3705 front-end processor as a 3726 terminal cluster controller.

The average cost per drop in an Equatorial network, Arst said, is between \$200 and \$250. This is based on recurring monthly fees and the purchase price of the C-200 micro earth stations, which cost about \$6,000 per station in quantity. Arst said the earth stations are often less expensive than 9,600 bit/sec modems. The monthly net service charges can vary from \$10,000 to \$100,000. The cost per drop depends on how many remote stations share the fixed costs for use of the master earth station and the satellite.

The company claims that the system is less expensive to operate than a private leased-line network used for the same application. Another benefit is a guaranteed bit-error rate of 10 to the negative seventh, which Arst claims is two magnitudes better than is available on terrestrial lines.

IN DEPTH



Of time and analysis

The problem is not how to represent requirements but how to figure out what they really are. The solution: define what should and should not be specified; develop strategies for applying the tools of structured analysis and the new specification framework. Then systems developers can spend their time developing systems instead of developing methodologies for developing systems.

By John F. Palmer

In an age of constantly advancing system implementation technology, huge application backlogs and scarce system development resources — especially project time — a systems analysis technique must do more than produce specifications; it must be efficient.

Essential systems analysis is a requirements modeling technique that fills the bill. It is a set of strategies for expediting the development of system requirements models using the documentation tools of structured analysis.

One of the worst things that can happen to a project team is to become stuck in one phase of the development process, unable to complete it except by giving up at an arbitrary date and going on to the next phase with an unfinished product.

For example, a Fortune 500 manufacturing company has been redeveloping its order entry system for nine years. The decision was made to rebuild the system because it was technologically obsolete: a completely batch computer system using sequential tape files. Furthermore, the system was almost impossible to maintain, since the code was a tangle of undocumented assembler language.

Three years after the company started analyzing the system, the project manager reported that the specification was 80% complete, but

that the team needed another year to finish it. Management, which could not wait any longer for results, demanded that the project manager forget completing the analysis and build a new system in that one year.

The project manager chose a narrow area within the original scope of the project and proceeded to develop a system to handle just that portion. Two years later, the new system was ready for testing. After a year and a half of testing, the manager decided that it was impossible to get the

The typical home remedy to analysis paralysis is to have the analysis team stop analysis with whatever it has at some arbitrarily set date and begin coding programs immediately. This decision is almost never well advised.

new system to do what it was supposed to do. Again, he decided to reduce the scope of the effort and start over. After another year of analysis, then a year and a half of design, programming and testing, this partial system was successfully installed. However, it couldn't solve more than 10% of the problem recognized nine years before.

Tradicional system development lechniques were used on this project. The analysis phase was intended to produce a 3,500-page narrative functional specification, while the system's design consisted of a single flowchart. Programmers invented the code spontaneously while pounding at a keypunch station.

In this case and in many other organizations, traditional approaches to system development have led to tremendous wastes of time. Primary among the time wasters are what I call analysis paralysis, systems installation runaround and modification cost inflation. These problems and their interrelationships are shown in the diagram on ID/I.

Analysis paralysis occurs when enormous amounts of time are spent in the analysis phase, resulting in volumes of useless documentation. The major reason for paralysis of analysis is an overly optimistic selection of project scope. The problem is compounded because no one knows what he should document as a requirement or how to tell if he has found all the requirements.

Poor documentation of the existing system adds to the

time it takes to specify the new system, as does using narrative text, the traditional documentation tool of systems analysis. The typical home remedy to analysis paralysis is to have the analysis team end analysis with whatever it has at some arbitrarily set date and begin coding programs immediately. This decision is almost never well advised. When you program software without understanding the system requirements, you pro-

duce a system that doesn't meet the user's expectations. That leads to the next major time trap in traditional system development.

Systems installation runaround occurs during the testing of software produced from a traditional requirements specification. In reviews of test results with the user, the development team finds that it omitted or misunderstood the user's requirements for the system. As the team tries to build the

correct features into the system, it usually finds more problems and more features that have to be added. While making these corrections, the programmers often introduce bugs into other parts of the software. More time is wasted identifying and fixing these bugs.

Eventually, managerial patience runs out. Management then decides whether the system should be scrapped or become operational despite its shortcom-

ings. More often than not, the makeshift system becomes operational. The new requirements that haven't been added yet become the first entries on the maintenance and modification list for the system. Coping with this list and with the more legitimate modification requests is the last major time trap, modification-cost inflation.

In most traditionally developed systems, it takes a lot of time to locate and fix



errors or to add new features. The quick fixes slapped on during installa-tion runaround have made the new system unnecessarily complex, inflating the costs of fixing or modifying

Also contributing to modification-cost inflation are the false requirements implemented in the system. Th are requirements that reflect the obsolete technology of the system being repla ced. By carrying forward fea-

tures of obsolete technology, the new system fails to make fullest use of the new technology. Since using new technology was probably the major impetus for the pro-ject, the false requirement ject, the false requirement problem is especially damag-ing. In addition, implementing these features makes the system unnecessarily com-

Another cause of modification-cost inflation is bad program design. In fact, in many traditional development efforts, no program design is done. Instead, programmers type in code directly from their reading of the analysis specifications. The typical result is tangled code, which makes modification planning much more unwieldy and time-consuming. Because of the tan-gle, the modifications themes often cause problen within the programs. Finally, poorly designed programs are unreliable, requiring more attention when they

are put into operation

Because of the many modifications that remain from the development effort, the unreliability of the system and the difficulty of making modifications, these syster gobble up resources that could otherwise be used to redevelop other systems. Under these circumstances, it doesn't take long before a system just installed is judged ready for redevelopment itself.

Meanwhile, for another

part of the organization, in another project, analysis pa-ralysis is beginning all over

Failure to communicate

These hazards are primarily the result of communication problems. Basically, the problem is botched communication about what the system requirements are and how they will be implemented.

There are two types of communication failures: those between system developers and system implementation machines and those between system developers and everyone else.

System developers often write specifications for computer systems as if they were specifying systems to be implemented by humans. This means they leave out needed detail.

Programmers do their best to write correctly functioning programs from these specifications. If they lack the necessary detail to write part of a program, they ei-ther query those who wrote the specification or they guess at the detailed requirements. In the end, however, the systems developed from these specifications rarely meet the expectations of the user community. This leads to the systems installation runaround problem.

Once analysts realize that their specifications are inadequate, they react defensively. On their next projects. they try to specify every possible detail of the new system. This vacuum cleaner approach to requirements specifications helps cause analysis paralysis. While studying the existing system, analysts vacuum many of its obsolete technological features into the specification. These unnecessary fea-tures find their way into the new system, leading to unneeded complexity and un-maintainable software.

Distorted messages

Communication problems arise between users and analysts and among analysts, data base designers and program designers. When these parties rely on traditional documentation, the requirement message usually gets tremendously distorted, leading to a system that doesn't even come close to meeting the original requirements.

The traditional approach to documenting requirements is usually some combination of the developer's own memory, the spoken word and narrative documentation. Memory and the spoken word are obviously unreliable, and narrative specifications also have serious problems that prevent good communication: They are long and wordy and provide no effective high-level descriptions of the system,

Lear Siegler Quality and Reliability You Trust. High Touch Style You'll Prefer.

This new generation of Lear Siegler video display terminals brings elegant High Touch" style to our American Dream Machine (ADM") tradition. The family features three new ergonomic terminals designed to meet the needs of OEMs and end users alike: the ADM 11, the ADM 12 and the ADM 24E.

Here is a whole new way for.

ADM 24E. Here is a whole new way for terminals to relate to people. Dozens of little touches add up to the convenience and comfort of High Touch. For example, we put the power "on/off" switch and contrast control knob in front where they're easy to reach.

to reach.

The monitor not only tilts and swivels, it stops positively in almost any position.

The clean, crisp display features a

Ine crean, crisp display features a large character matrix on an easy-to-read green or amber non-glare screen-made even easier to read by the hooded bezel. Screens are available in 12" or 14" sizes.

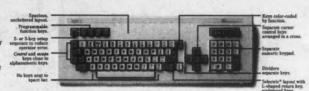
You get the best in style and ergonomics, plus all the outstanding performance features you'd expect from Lear Siegler (see chart).

Lear Siegler High Touch terminals are backed by the broadest network of full service centers anywhere, serving 3000 cities nationwide. And they're made in America—designed, engineered, manufactured and shipped from Anaheim, California to provide you with the best local support.

Place your order today by calling your local Authorized Distributor or, for quantities in excess of 500 units, your Regional OEM Sales Office.



Lear Siegler's new VersaPrint" 500 Series printers combine with Lear Siegler video display terminals for hard copy output.



Low-profile, tapered, DIN-standard keyboards with Selectric layout feature logical key groupings and adjustable tilt for comfort and efficiency. ADM 11 shown above.

	ADM 11 Conversational	ADM 12 Editing	ADM 24E Host Programmable
Programmable Function Keys	4 (Shiftable to 8)	16 (Shiftable to 32)	16 (Shiftable to 32)
Non-Volatile Function Keys	Optional	Standard	Standard
Function Key Legenda on 25th Line	From Host	From Host	Standard Non-Volatile
No. of Pages of Display Memory	1	2	2or4
Display Memory Configurations (Plus 25th Message/Status Line)	24 Lines by 80 Characters	(2) 24 x 80 or (1) 48 x 80 or (1) 24 x 158	User Definable up to 96 x 80
Scrolling	Standard Scrolling	Smooth, Jump or Horizontal Scrolling Split Screen	Smooth or Jump Scroll Split Screen
Transmission Mode	Conversation Mode	Conversation or Block Mode	Conversation or Block Mode
Editing	Limited	Full Editing & Protected Fields	Full Editing & Protected Fields
Visual Attributes: Reduced Intensity, Blink, Blank and Reverse Video. Underline also on ADM 12 and ADM 24E	3 Embedded 1 Non-Embedded	4 Embedded, 1 Non-Embedded or All Non-Embedded, plus Full Screen Reverse Video	5 Embedded, 1 Non- Embedded or All Non- Embedded, plus Full Screen Reverse Video and Highlight
OEM Flexibility	Modifiable Set-Up Characteristics	Modifiable Set-Up Characteristics & Personality	Modifiable Set-Up Characteristics. Add to Program in ROM or Down-Line Load in RAM (56K ROM or RAM. Up to 22K Display Available) Room for additional Logic Boards.
Terminal Compatibility	ADM 3A, ADM 5. ADDS Viewpoint & Regent 25, Hazeltine 1400, 1420 & 1500, also available.	ADM 3A, ADM 5, ADM 31, ADM 32	ADM 3A, ADM 5, ADM 31, ADM, 32, ADM 42

Call Lear Siegler at 800/532-7373 for the phone number of an authorized distributor near you: Advanced Technology - Continental Resources - The Datastore - Data Systems Marketing - David Jamaison Carlyle, Inc. Digital Source - Dytec/South - Gentry Associates - Hail-Mark Electronics - Inland Associates - Kiterulf Electro M/A Cam Alianthus, Inc. - Marva Data Services - M.T.I. - National Computer Communications - Pioneer (Stan Harvey, Gaitherburg) - 2M Corp. - Wyle Electronics

Distributor Sales & Service: Boston (617) 456-8228 · Chicago (312) 279-7710 · Houston (713) 780-9444 Los Augeles (714) 778-100, et. 239 · Philadelphia (215) 245-4080 · San Francisco (415) 828-6941 · England (94807) 39666 · From the states of CT, DE, MA, MD, NJ, RJ, van ad WV (300) 252-5223. OEM Sales: Atlanta (404) 971-9781 • Chicago (312) 279-5250 • Los Angeles (714) 774-1010, ext. 582 • New York (516) 549-6941 • San Francisco (415) 828-6941 • England (04867) 80666



901 E. Ball Road, Anaheim, CA 92805 (714) 774-1010

© 1984 Lear Siegler, Inc.

oint and Regent are registered Trade arks of Applied Digital Data Systems, Inc. VT-52 is a regis

forcing the reader to get lost in details. In addition, the narrative form tangles the requirements so that the document cannot be read in small increments.

Finally, narrative documentation cannot clearly represent important relations between the activities in the system and between the system and the outside world. As a result, some of these relationships are omitted or stated redundantly.

Better modeling

The communication problem between system developers has been solved with a technique commonly known as structured analysis. This is a set of documentation tools and conventions for building better models of system requirements. Its central tool is the data flow diagram, which declares the existence of activities, data flows and data stores.

The diagram must be supported by two additional structured analysis tools that rigorously define the details of the activities, data flows and data stores. These two additional tools are the minispecification (a description of each activity) and the data dictionary.

Although structured analysis gets rave reviews for improving communication of complex requirements, it does not solve the problem of what to specify when developing automated systems. Projects using structured analysis encounter several difficulties when applying the technique.

Classical approach

The crucial managerial problem is that structured analysis takes too long. Although project teams have far superior documentation tools, they are still using the vacuum-cleaner approach to requirements gathering. That is, they document every feature of the system, just in case it is needed. Structured analysis paralysis is thus born, complete with a structured vacuum cleaner.

These problems are the legacy of the communication problems between people and machines. The people who try only structured analysis still have little idea of what they should specify to get the right system developed. However, structured analysis is indirectly making a major contribution to solving this problem. Having solved the problem of how to say it, system developers are identifying the more difficult problem of what to say in a requirements specification.

Structured analysis takes a step in this direction through its high-level procedure for building a specification. This procedure is based on the reasonable assumption that the major difference between the new system and the old is the technology used to carry out the system's activities.

Because the new system carries out much the same business policy as the old, the structured analysis procedure has analysts specify the relevant features of the old system before specifying the new features. The major break with the traditional approach is that systems developers must distinguish the logical and physical features of the system being specified.

Structured analysis defines "logical" to mean business policy and "physical" to mean a particular way of implementing business policy. In a customer billing system for a utility company, the procedure for deriving The crucial managerial problem is that structured analysis takes too long. Although project teams have far superior documentation tools, they are still using the vacuum-cleaner approach to requirements gathering. That is, they document every feature of the system, just in case it is needed.

usage would be considered logical, while the computer and the auxiliary disk storage that implement this policy would be considered physical.

When studying the old system, two activities are performed: build a current physical model, and extract a current logical model from that current physical model by removing features that have to do with a par-

ticular implementation of a business policy. When specifying the new features of the future system, another two activities are performed: build any new business policy into the current logical model, and build a model that shows how that new business policy will be implemented (new physical model).

Building logical models prevents

the analyst from including obsolete technology in the requirements. More important, if the analyst tries to bypass the logical model by modeling functional and technological requirements together, the model will become so complex that some logical requirements will be overlooked and omitted.

The most prominent technical problem in using structured analysis is the difficulty of finding truly logical requirements. Practicing analysts are frustrated by the vague and subjective distinctions between logical aspects of a system and those considered aspects of systems implementation technology. Project teams frequently engage in prolonged, acrimonious and ultimately inconclusive debates on this issue. Then, upon finishing their models, analysts often wonder whether they have



succeeded in completely specifying logical requirements and leaving out irrelevant aspects of systems implementation technology.

Similar problems are encountered with determining the context of a system and the level of detail that should appear in a minispecification. When this confusion occurs, the typical response is to document more than needed to be on the safe side. The vacuum cleaner is started, and a ton of requirements — some legitimate, some not — are gathered and documented.

Since the problem is not how to represent requirements but what they really are, the first part of the solution is a framework that defines what should and should not be specified. This framework should define what the subject matter of systems analysis is. It should also explain the



Figure 1. Context diagram

typical logical and physical requirements of a system. Finally, it should state the level of detail required for effective system specification.

The second part of the solution is a set of basic strategies for applying both the tools of structured analysis and the new specification framework. With these strategies, system developers can spend their time developing systems instead of developing methodologies for developing systems. These strategies provide detailed guidance on the development of both logical and physical requirements models.

Essence of the technique

Essential systems analysis is a precise technique for defining system requirements. It defines what should be specified and provides a

set of strategies to develop a proper specification using the tools of structured analysis.

Systems development has a vocabulary of its own. Concepts such as "modular hierarchy," "data independence" and "third normal form" help system developers design programs and data bases. The system development vocabulary is richest by far in words that describe computer technology. Until essential systems analysis, the vocabulary for requirements definition was relatively small.

The essential systems analysis framework provides a terminology that allows better communication and concepts that help both analyst and user organize their understanding of complex sets of requirements.

The framework has a number of components. This article will focus on six of them: planned response systems, the types of system requirements, the perfect technology principle, the essence of a system, incarnation requirements and essential model partitioning themes.

Planned response systems. The essential systems analysis definition of what should be specified starts with a definition of what a system is.

A system responds to a select set of events that occur in its environment. For example, in a hotel, the wake-up system interacts with the hotel guests by accepting their wake-up call requests and waking them up at the proper time. The wake-up service responds to the event "Guest requests wake-up call."

Context diagrams reflect the interactive nature of systems (see Figure 1). The circle on the context diagram represents the system, or response mechanism. The rectangular boxes represent the entities in the environment with which the system interacts. Crossing the context are data flows representing the interactions the system has with its environment.

These interactive systems have two ways to respond to an event: an ad hoc way or a planned way. Ad hoc responses are made up after the event has occurred. The wake-up system does not expect a request that a guest be awakened with a marching band. However, if the guest were the CEO of the hotel chain, an ad hoc decision might be made to satisfy that request.

Planned responses are thought out in advance of the particular event. Once designated, these responses are executed every time the event occurs. The normal process of waking guests up at the appropriate time is an example of a planned response.

Essential systems analysis focuses on the planned response component of a system, which is appropriate for developing automated systems. Essential systems analysis calls this component the planned response system. By defining the planned response system, the technique helps avoid the problem of selecting an overly large project scope, since analysts will not waste time on ad hoc responses.

Two types of requirements. Having focused on the planned response system with an interactive system, the analysis defines the two major types of planned-response-system requirements: essential requirements and incarnation requirements. These two types of system requirements correspond roughly to what structured analysis calls logical and



Essential systems analysis uses the concept of perfect technology as a tool for distinguishing essential features. The essence of a system is the set of planned responses that would have to be carried out even if perfect technology were available.

physical requirements.
The essential requirements (also known as the essence of the system) are those features that are independent of the technology used to implement them More specifically, the es sence of a system is all the planned responses that would have to be executed regardless of the technology used to implement them. As an example, the Wake Up Guest activity would have to be carried out regardless of

whether the hotel uses people, computers or alarm

clocks to provide the service. The incarnation require ments (also known as the implementation of the system or of the essence) are those features that depend on the choice of technology. The planned responses executed by the system will be implemented using people, com-puters, manila folders, magnetic disk files, four-part forms, paper clips and so on. The selection of these components and the integration with the essential features are the incarnation require-

Perfect technology. Essential systems analysis uses the concept of perfect tech-nology as a tool for distinguishing essential features.
The essence of a system is
the set of planned responses that would have to be carried out even if perfect tech-nology were available. With perfect technology, the most complex system could be im-plemented with a single perfect processor. A perfect pro-cessor costs nothing, does any task, handles any work load, works infinitely fast and never makes a mistake. The wake-up service can be used as an example of the application of the perfect technology principle.

The current implementation of the wake-up system is a human operator who takes the requests and a computerdriven tape system that de-livers the calls. With perfect technology, one perfect pro-cessor could do all of the work. The operator in the current implementation of the system might record the wrong room number when a call is requested or forget to call the guest. However, mis-takes like these are impossible with perfect technology. Such a system would also cost nothing, requiring neither capital expenditure nor paychecks

The perfect technology concept was one of the first developments of essential systems analysis. After this concept was applied to enough systems, certain kinds of essential features emerged as being identical from one system to another. These standard essential features are fundamental activities, custodial activities and essential memory.

The essence of a system. Systems are created to serve some purpose or set of purposes. For example, the wake-up service exists to help guests make their scheduled appointments. The hotel hopes that this service will be a valuable convenience that will encourage guests to stay at the hotel again and again. Fundamental activities are those that directly accomplish the purpose of the system. In the wake-up service, the fundamental activity is Wake Up Guest. In a payroll system, one of the fundamental activities is Pay Worker. In a customer information system for a utility, one of the fundamental activities is Bill Customer.

Fundamental activities need information. In a payroll system, the fundamental activity Pay Worker requires the hours worked by an employee paid on an hourly basis, the wage rate and the deductions that should be taken out of the employee's paycheck. Some of this



In heavy network traffic, high performance isn't a luxury.

If your networking plans include more than five or six PCs, high performance isn't a luxury.

The Net/One Personal Connection™ packs the microprocessing power to offload all networking functions, so it doesn't eat up the host CPU's resources. That frees up a work station that other systems require simply to do their network's work.

At stations on the net where this additional

intelligence isn't required, plug our newest, most economical Personal Connection board into the PC, and bring your cost-per-connection down to where it would be tough to justify buying anything less. The full network functionality is all there with either of the two interface boards. But now, with the option to pay for only as much

intelligence as you need at each station, we've made it possible to have a real network at PC network prices: Printshare,™ Mailshare,™ Diskshare,™ access to the corporate network-

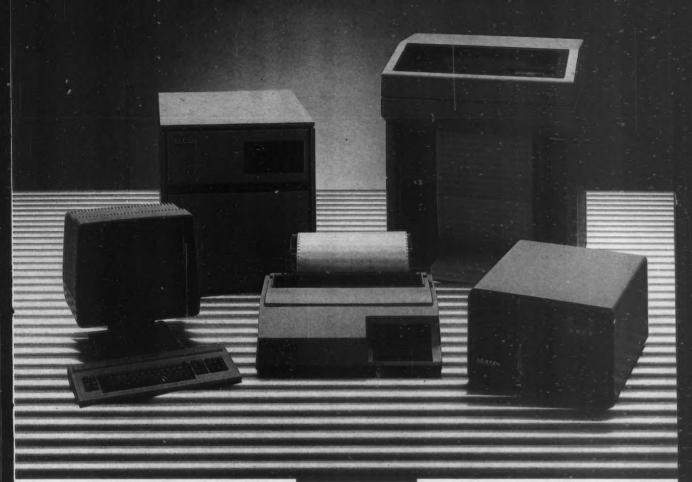
everything.

Net/One® is the general purpose local area network system that can turn all the equipment you have now, no matter who makes it, into a fully functional, high performance network. Broad-band, baseband, fiber optics. Mainframe to mini to

micro. Local to remote. Give us a call. Ungermann-Bass, Inc. 2560 Mission College Boulevard, Santa Clara, California 95050. Telephone (408) 496-0111.

Net/One from Ungermann-Bass





In business, class is measured not by noise level, but by performance level. What work gets done. And when. How work gets done. How well. For how much.

By that standard, the ELAN*
System from Braegen is clearly the class of 3270, delivering more practical innovations. Innovations that dramatically increase throughput and flexibility, while decreasing hardware and support costs.

The ÉLAN System, for example, gives you powerful LAN capabilities, without your investing in special LAN technologies. You use existing coax. And thanks to our multi-drop, station-to-station format, you use much less coax.

The ÉLAN System gives you more intelligent controller solutions. Solutions that let you switch hosts, applications and personalities. Solutions that let you build local 3270 networks with up to 120 devices, local and remote attach, remote dial-in. Solutions that let you combine

THE CLASS OF 3270 three workstation levels: Full edit/inquiry; integrated multi-user IBM personal computing using shared resources; and the direct attach of IBM PCs and compatible micros.

The ELAN System gives you more practical innovations, the kind that do their work on your company's front and bottom lines. And behind the lines, perhaps the most practical benefit of all—a nationwide Braegen service network.

The ELAN System. A tough act to follow. Because it's the class act of 3270.

BR/EGEN

The Braegen Corporation 525 Los Coches Street Milpitas, CA 95035 (408) 945-8150, TWX: 910-338-7332 Braegen Technologies, S.A.

Braegen Technologies, S.A. Avenue De Tervueren 252-254 1150 Brussels, Belgium (02) 771-01-74, Telex: BRA I B 64150

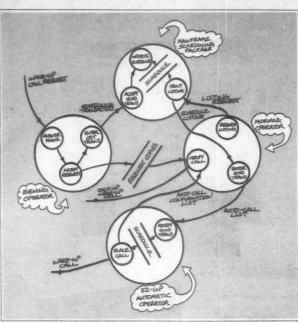


Figure 2. Wake-up system showing implementation-dependent features

information comes from the system's environment when the event to which the system is responding occurs. When the employee submits a time card, the system obtains the hours worked. Other pieces of information come from events and responses that occurred previously This information is remembered in the system's essential memory

Essential memory is the total information about past environmental events and system responses required by the fundamental activities of the system. In the wake-up service, the Wake Guest Up activity requires information identifying the guest and the time of the wake-up call. In a typical case, this information is presented to the system hours before the wake-up call will be made. The system must remember it so that it will be available when the fundamental activity needs it.

The need for essential memory

leads to the last essential component: custodial activities. Custodial activities are the activities that create, modify and delete essential memory. Their job is to keep the essential memory up-to-date so that it will be appropriate for the fundamental activities. In the wake-up service, Record Wake-Up-Request is a custodial activity. It records the guest who requested the wake-up call and the time that the call should be placed.

Typical incarnation requirements. The essential systems analysis framework also helps system developers distinguish essential features by showing them what system components are not essence. That is, it identifies the implementation-dependent features that are part of most real systems. These features result from the use of imperfect technology, which costs money, has limited capability and capacity and makes mistakes. Developers can recognize these nonessential features and remove them from essential models.

The major implementation-dependent features of systems are illus-trated in Figure 2. This figure shows the wake-up system as it might look

in a typical hotel. Notice first that the essential activities have been fragmented and allocated to four different processors. Fragmentation of this sort is a major implementationdependent feature. How the essential activities are fragmented depends on the capabilities and capacities of the processors used in the system

Some activities in Figure 2 exist simply to transport data from one processor to another (for example, Answer Phone and Enter CRT Transaction). They make it possible for processors executing fragments of the same essential activity to com-municate. Essential systems analysis calls these activities the infrastruc ture of the system since they are like transportation systems that ship goods to different markets. Instead of goods, however, the system's in-frastructure ships data. The layout of the infrastructure depends on the particular fragmentation and allocation of essential activities in a given

Finally, Verify Call in Figure 2 is an example of an activity that protects the system against the fallibility of its technology. Because a real implemented system makes errors, it has activities that detect, correct and prevent those errors. Essential systems analysis calls these activities the administration of the system. The administration ensures that the system will execute the proper es sential responses. The administration is dependent on the particular kinds of mistakes a given system can

Essential model partitioning

A strategic senior management conference on the effective integration of data processing, office automation, telecommunications and related information systems

Charting the Course

Mastering the Islands Of Information Technology

October 7-11, 1984 Hyatt Regency O'Hare, Chicago

Sponsored by the Society for Information Management, the leading professional organization for chief information officers and senior-level information systems managers. This conference will bring together 400 of the nation's top information executives, along with such outstanding speakers as F. Warren McFarlan, Thomas Gerrity, Michael Hammer, Richard Byrne and many others. The topic is of critical importance to senior management in every large business, in the private or public sector. Non-members of the Society are encouraged to attend.



For complete details please contact:
Nancy Liebner, Conference Registrar Society for Information Management 111 East Wacker Drive Chicago, IL 60601 (312) 644-6610

Society for Information Management

NOW YOU AN SHOP WITHOU EAVING YO

All you have to do is move your fingers from the buttons on your computer to the buttons on your phone and call our toll free number for Burroughs' Computer Support Service Catalog. From then on, you'll be able to buy everything

from printout paper, to letterhead, to invoices by phone or mail.

CSS's prices include freight and handling (in the continental U.S.). And there's no extra charge for printing in any of six typefaces.

Plus, CSS forms are designed to fit most pop-

ular software packages. So call for the CSS catalog, you may never have to leave your computer again.



Call 1-800-621-2020 Ext. 330

themes. Analysts need to partition the system into chunks so that the specification reader never has to absorb too much at once. Although a proper partitioning can be represented with the tools of structured analysis, that partitioning cannot be derived by the tools themselves. Instead, the essential modeler must decide on how the essential activities and memory should be partitioned.

There are an infinite number of ways to partitioned. There are unacceptable; they either obscure the true essential requirements or introduce false essential requirements. Yet, analysts typically choose a bad partitioning of essence because structured analysis offers them little guidance.

To solve this problem, essential systems analysis proposes the use of partitioning themes. A partitioning theme is a precisely defined way to partition essential features that does not introduce bias toward a certain technology. We have two partitioning themes: event partitioning for activities and object partitioning for memory.

The planned response system responds to events in that system's environment. With event partitioning, all activities that would have to be carried out in response to one event are placed in a single activity-called an essential activity. Each event to which the system responds has a corresponding essential activity. Figure 3 shows the essential activities in the wake-up system. Since the wake-up system responds to two events, "Guest requests wake-up call" and "Time to wake guest up," its essential model contains two essential activities.

The data in essential memory describes the characteristics of either real or artificial things called objects.

In a customer billing system for a utility, data would be remembered about the real objects "customer" and "meter" and about the artificial objects "account" and "meter reading." With object partitioning, all data elements that partially describe a particular object are grouped together. The result is called an object data store. Essential memory is partitioned into one object data store for each object about which the system needs to store information. Figure 4 (on ID/10) shows the object-partitioned essential memory of a simplified customer billing system.

The components of the essential systems analysis framework categorize both the implementation-tech nology-dependent and implementation-technology-independent features of a system and provide a language for communicating about these features. The framework orga nizes the system into understandable chunks, thereby making a complex system accessible. By eliminating much of the confusion and ambiguity concerning what should be specified. the framework eliminates the need for a vacuum-cleaner approach to analysis. The result is more efficient and effective system development.

The essential systems analysis framework has proven to be successful in helping system developers distinguish and define both essential and incarnation requirements.

Analysis strategies

From using the essential systems analysis framework on numerous system development efforts, Steve

McMenamin and I have developed two different types of systems development strategies: technical strategies and managerial strategies. The technical strategies ignore the

The technical strategies ignore the real-world constraints that affect most projects. Project deadlines, personnel shortages, lack of automated system development tools and quality assurance problems are irrelevant to the technical strategies. Instead, each technical strategy states only system development activities that must be carried out regardless of particular management constraints.

The managerial strategies are technical strategies reorganized to face real-world constraints, the most important of which is time pressure. Managerial strategies state how to carry out technical strategies in order to minimize the time needed to

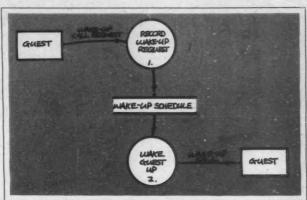


Figure 3. Essential activities



EQUITABLE LIFE

LEASING CORPORATION

10251 Vista Sorrento Parkway, Suite 300, San Diego, CA. 92121

develop the system.

System developers benefit from having the two strategies separate. The technical strategies convey an understanding of essential system development activities that is impossible to achieve without factoring out the complications of the real world. Without these constraints to worry about, there are fewer activities, and those that remain can be ordered in the way that makes most sense.

Once the technical strategies are understood, the managerial strategies protect the analyst from the dangers of naivete and remove the need for him to adapt the technical strategies to the real world. Because the technical activities have already been explained, the managerial strategies can concentrate on coping with constraints.

The technical strategies

The overall technical strategy has three essential activities: Define Essence, Select Incarnation and Build System. The first two essential activities each produce a model of one type of system requirements; Define Essence produces an essential requirements model, while Select Incarnation produces an incarnation requirements model. The last essential system development activity, Build System, is the activity that translates the system requirements model into a functioning system.

The high-level technical strategy has no quality assurance checkpoints and makes no reference to organizational units like system deADD ACTOR SILL CASSANTIAL PROPERTY

Figure 4. Object-partitioned essential memory for billing system

velopment or data administration departments. Quality assurance checkpoints, although absolutely necessary in the real world, have been removed to streamline the technical strategy. Assignment of activities to organizational units — again, a necessity in the real world — is not specified so that arguments over who does what can be avoided until

everyone knows what the group, as a whole, must do.

In addition, the high-level technical strategy makes no mention of traditional system development activities like analysis and design. There are so many different definitions of what activities constitute analysis and design that these terms have become almost meaningless.

Finally, no project planning or control is reflected in a high-level technical strategy. Since for the moment we assume there are infinite resources (both people resources and time), there is no need for developing a plan to husband them economically.

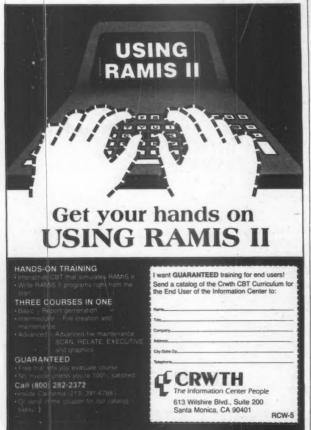
The first step in the technical strategy is defining essence. It results in a structured analysis model that specifies the essential activities and memory of a new system down to the data element level.

There are two alternative strategies for executing the Define Essence activities. One strategy is to define essence from scratch, and the other is to derive an essential "base" from some existing system and add an essential increment to that base.

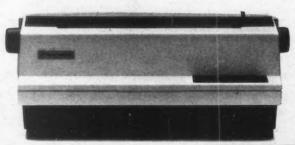
When essence is derived from scratch, it is created directly from knowledge of a system's environment. This strategy is required when the essence of the new system is different from the essences of all known systems or when information about similar essence is unavailable.

There are two activities in this strategy: Create Individual Essential Activities and Create an Integrated Essence. Because the interaction between essential activities is often complex, it is easier and safer to create each essential activity individually first. Once enough of them are defined in isolation, then the essential activities are connected to each other.

The more commonly used strategy is the base/increment strategy. In this approach, system developers



Better letters.



We can't help your spelling or grammar, but we can help your important correspondence look a little brighter than the next guy's. In less than a minute our DP-55 daisywheel dashes out a letter-perfect page. Throw out your white out, call your printer distributor. Or contact Dataproducts at (213) 887-3924, 6200 Canoga Avenue. Woodland Hills. CA 91365. In Europe. 136-138 High Street. Egham. Surrey. TW 20 9HL England.



Dataproducts Daisywheel Printers

From the current implementation model, developers derive an essential model of the existing system. They restructure the current implementation model to resemble the essential model's structure as closely as possible.

"back into" the definition of the new system's essence. First, the essence of an existing system that is close to that of the new system is modeled. This model provides a base of essential features for the new system. The new essential features are then created and added to the model of the existing system's essence

System developers also back into the model of the existing system's essence. First, a model of the existing incarnation, a model that shows how the technology of the current system implements essential features, is built. The current implementation model is the opposite in structure from the current essential model. In the former, the essential activities and memory are fragmented and assigned to many different computers. people and organizations. In the latter, the activities and memory are whole and are partitioned according to events and objects.

From the current implementation model, developers derive an essential model of the existing system. They restructure the current implementa-tion model to resemble as closely as possible the structure of the essential model. The model of the current systems implementation is necessary for two reasons. First, often the only way to find existing essential features is to model them first within their technological hiding place. Second, even if these essential features could be derived directly, they have to be verified by others who know the existing system. To be able to confirm current essential features. these people may require a model that looks like the system they know.

Three essential activities make up the strategy for deriving a current essential model: Find the Fragments of Essential Activities, Model Each Essential Activity and Integrate the Essential Activity Models. The last two activities are similar to the activities in creating essence from scratch. In both cases, essential activities are modeled individually, and connecting the activities is deferred until the next step

Select incarnation

As in defining essence, there are two strategies for selecting an incarnation. Also as in defining there is a strategy for defining the incarnation model from scratch and a strategy for deriving an incarnation based on an existing incarnation

Many projects implement a sy tem's essence using a radically different form of system implementation technology from that of the existing system. They may be build-ing an organization's first data base system. These projects have to create a new configuration of technological components.

An incarnation model is created by four activities. In the first activity, the processors (people and com-puters) are selected. It is here that decisions are made about which activities or pieces of activities a given

person or computer should carry out. The result of this step is a model of the processors selected for the new incarnation and their activity assignments. In the next two steps, the infrastructure and administration for the new system are created and modeled

Many projects implement a system's essence with a technological environment already in use within an organization. For example, the

PROTOCOL CONVERSION

With Innovative's MC-80 Protocol Conversion Series, you don't just get low cost solutions to your network compatibility problems, you get much

- Total technical support
- Dial-up capability
- Network compatibility
- · On and off line diagnostics
- · Direct or Remote Communications

Call us today, toll free, for more information on our NEW and existing

- IBM 3270 SNA/BSC to (4-24) ASCII Devices
- IBM 3287/68 Type A COAX to ASCII Printers IBM 3270 SNA to NCR Poll Select
- IBM 5251/5256 Emulation for IBM 34/36/38
- IBM 2780/3780 BSC to ASCII Devices

- IBM 3270 BSC to ASCII Devices/Host IBM 3270 BSC to Burroughs/NCR Poll Select Burroughs Poll Select to ASCII Devices

Innovative

(305) 624-1644 1-800-327-3955

INNOVATIVE ELECTRONICS, INC. 4714 N.W. 165th St., Miami, FL 33014

ATTENTION NETWORK STRATEGISTS

IF YOUR IBM PCs HAVE PROBLEMS COMMUNICATING, CALL 800-343-0515

Now there's an inexpensive and versatile PC/Mainframe Communications Link ready

for immediate delivery.
Pathway Design SNA 3270 and 3770 Emulators and BSC 3270 and 3780 Emulators are proven products with a loyal following. Join the long list of satisfied Pathway customers today. For more information or to order call our toll-free HOTLINE 800-343-0515

Get 3270/3770 Functionality Without Expensive Protocol Converters or Controllers.

Our software products and communications adapters enable your PC to inexpensively emulate 3270 Information Display System devices or 3770 remote job entry stations. And, they include many value-added communications features for unsurpassed versatility.

Access a wide variety of communications networks without ever changing the board. When you plug our board into an available ansion slot it acts as multifunction circuit board supporting SNA/SDLC, BSC, HDLC and asynchronous protocols.

ing formats. You can upload or download information to your screen or to a disk. And, the 3770 offers newly-enhanced file transfer capabilities including the transfer of executable images and ASCII text files plus standard data files and JCL commands. Host-Initiated And Local Multiple

different locations in suitable data receiv

Concurrent Printer Support.

Pathway Design products give you the abil-ity to configure multiple printers and per-form host-initiated and local print functions concurrently and independently

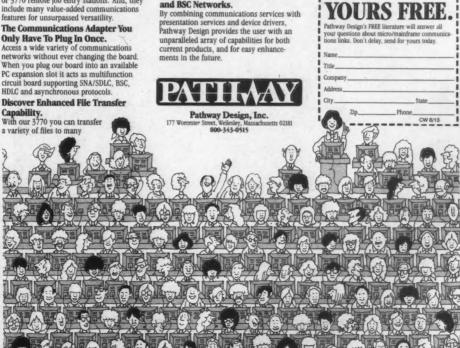
Pathway Design's Three Part Architecture. The Most Powerful PC-Mainframe Link Ever for SNA and BSC Networks.

By combining communications services with presentation services and device drivers, Pathway Design provides the user with an unparalleled array of capabilities for both current products, and for easy enhance

No One Can Emulate Pathway **Design For Products, User Support** And Price.

Pathway Design products come with a lifetime software warranty. Complete easy-to use documentation is provided. Our toll-free Customer Support HOTLINE number is in place and manned by experienced engineers and programmers. But, the best thing about Pathway Design products is the price.

If your IBM PCs have a problem commu nicating with your mainframe host, you should communicate with Pathway Design. Call 800-343-0515 today (617-237-7722 in Massachusetts) or return the coupon below



firm may have many systems already running on a large mainframe with on-line access and data base management system file implementation, and the project at hand must use this environment when the new system is installed. The strategy would require a new first step: an activity to assess the target implementation environment.

The managerial strategies

The managerial stategies of essential systems analysis are designed to help speed the development of systems without sacrificing quality These strategies are based on a com-mon premise: Knowledge of the dimensions of system development work on a particular project must be obtained before resources are committed to do that work. You wouldn't want a project team to work for six

months before realizing that the project either is too big, addresses the wrong problem, works toward the wrong solution or uses an inappropriate approach. In each case, great amounts of precious system development time are lost.

Each managerial strategy has the project team establish the dimensions of system development work remaining. In the process, the team can check to see if the selection of problem, solution or approach is appropriate. Early detection of problems will allow project management to revise plans without wasting time

In the first activity of the overall managerial strategy, the essential systems analysis framework and the tools of structured analysis are used to produce high-level models of the new system. By building these models, a project team can learn the type and amount of project work required to complete the development effort. These models are then used to develop a working prototype of certain system requirements. In the remaining activities of the strategy, these high-level models are completed, and complete system is built

At a more detailed level, the Model System (high-level) activity consists of three subactivities: Blitz an Essen tial Model. Blitz an Incarnation Model and Develop a System Prototype. Blitzing refers to the rapid development of a model just complete enough for estimating purposes When gauging the dimensions of a system development effort, it is important to assess the work that must be done to define both kinds of sys-tem requirements. Therefore, a highlevel model of each type of requirement for the new system should be

developed. The three lower-level activities that make up the Model and Implement System (detailed) activity are, naturally enough, Compile the Essential Model, Complete the Incarnation Model and Complete System Construction.

Expedite development

The framework and strategies of ential systems analysis help expedite the process of system develop-ment. The essential systems analysis framework helps analysts avoid false requirements that would paralyze the analysis effort and lead to systems installation runaround and modification-cost inflation. It also tells what should be specified when exporting a system to an automated implementation environment.

The technical strategies of essential systems analysis help developers speed up their work by showing them how to build both essential and implementation requirements models. The managerial strategies optimize system development by providing the dimensions of the effort up front. Using this information, project managers can develop a plan that makes best use of available resources

Traditional development methods add to the difficulties of trying to stay technologically current. These methods create a vicious cycle of time traps that ultimately lead to system development gridlock. The modern approaches of structured analysis and essential systems analysis go a long way toward expediting the system development process Both techniques solve the kinds of communication problems that can slow projects to a crawl.

About the author

John F. Palmer is one of the founders of the Atlantic Systems Guild in New York and a main architect of the Yourdon structured analysis technique.

Prior to his association with the Guild, Palmer was a systems analyst at a major New York State bank and a consultant at Yourdon. He now consults in the areas of project management, systems analysis and data modeling.





to PC's for the mainframe end user

base support, color graphics **DYNAPLAN** - mainframe power

with micro simplicity DYNAPLAN - for VM/CMS, MVS/TSO systems

For a free 30-day trial call

(312) 525-6400 Chicago Soft

738 N. LaSalle

Chicago, IL 60610





Are the risks worth taking?

Integrating information services jeopardizes the resources of the company as well as the reputation of the information systems executive. Here's how to measure risk vs. return.

By M. Victor Janulaitis

An executive of a large western bank described his dilemma recently:

"Every time I turn around, our vice-president of information systems is coming into my office with another proposal — a million dollars for some new word processing and computer equipment, \$85,000 for an updated software package or, as I have sitting on my desk now, a multimillion-dollar proposal for installing an advanced worldwide telecommunications network. I am inclined to look favorably on these proposals, since our past ventures into information services generally have been successful. Interestingly, however, virtually every department in the bank also has some complaint about our current systems. What bothers me is that my intuition is not as sharp in computers and communications as it is in lending, borrowing, site location and other traditional banking areas.

"Today, electronics is a necessary part of our business. The fine line between products and services has disappeared as our bank has become more computer-based. In this age of deregulation and advancing technology, I cannot imagine running our bank without office automation, computers and communications networks. In addition, we must continue to advance in these areas if we want to stay even with or get ahead of our competitors."

Integrating information services technology involves risk. Many managers feel risk is something to be avoided. They are satisfied with the low rates of return they receive because they assume minimal risk.

The questions the business executive wants answered are: "Why should our organization take the risks associated with integrating information services?" and "What is an acceptable

IN DEPTH/WORTH THE RISKS?

level of risk?" The response to these questions is, you do it in order to gain a competitive advantage consistent with the level of risk you can successfully manage. The challenge is to develop a strategic plan for achieving this objective.

Competitive strategy rests on five forces:

 The relative bargaining power of buyers/customers.
 The relative bargaining power of suppliers.

3. The rivalry among ex-

isting firms.

4. The threat of new en-

trants.
5. The threat of substi-

tute products or services.
Information services technology has helped some organizations to gain competitive advantage in each of these five dimensions. The Wizard System, for example, helped Avis improve the product and service it delivered to its customer. The system provided Avis with information about the location, cost and

performance of its fleet. This information helped Avis to bargain more effectively with its suppliers. It gave Avis an advantage over Hertz, National and the other car rental firms.

The national network and the service levels it established "upped the ante" for getting into the business and served as a barrier to entry.

In addition, the Wizard System improved the cost/ performance ratios and forestalled the development of substitutes.

There are several distinct categories of information services organizations that can be grouped into three generic sets. Every organization typically has some characteristics of each set, but for the most part, favors one of the three:

Strategic-technology-directed — Information services are an integral part of the organization's unique strategy. This type of organization has an experience base that allows it to be involved with most leadingedge technology and spends significantly more than its nonstrategic-technology-directed competitors on data processing.

One of the interesting

One of the interesting characteristics of this type of organization is the long tenure of the senior management team — including the information services organization. Some industries are technology-directed (airlines in the 1960s, national hotel and car rental industries in the '70s and the retail and financial services industries in the '80s).

Business-directed — Information services are used to provide the necessary information support for its key strategic business units. This type of organization has an experience base that will allow it to be involved with one new technology at a time, for example, data base. The senior management team does not push its information services group to be first in the application of technology. Rather, the team wants to be sure the organization can do anything its competition can do within a reasonable period of time.

This organization typically goes through the standard sets of confrontations within its structure and establishes priorities.

In addition, multiple centers of power and expertise compete for authority in establishing, implementing and controlling technological direction in the organization.

Manager-directed - Information services are used to provide information for basic management functions such as production, accounting, finance and marketing, This type of organization has a very limited experience base and only takes on new technology when it is forced to. Typically, there is one key decision maker who is not in favor of computer or communications technology. One such organization had a president who was proud of the fact that he had "unplugged" all the computers in the organization, and it was still profitable.

In this type of organization, if a manager can justify an application of computer technology he is the one who goes to bat for it. The typical application portfolio for this organization is focused on operational control types of applications and is moving toward the implementation of management control applications. I estimate that between 15% to 20% of corporations fall into this category.

Gaining an edge

How can an organization gain a competitive advantage through information services? The following five steps help:

Assess the techno-

All consultants look alike.



Until you start asking a few questions.

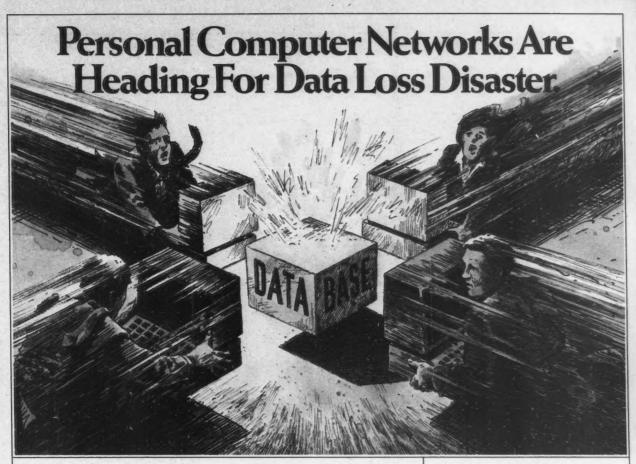


You need some answers. And that's the "moment of truth" that separates an On-Line Software International consultant from the rest.

Our people are seasoned professionals with years of specific on-line experience. Heavyweights, not juniors. And their individual expertise in CICS, IMS, operating systems and networking is reinforced by our unique communications and data base system. A network that lets each consultant tap the vast experience of our entire organization.

If you want to know more about how we can analyze and execute your project, call us or mail the coupon today. You'll get a prompt answer. The first of many. Call toll-free 800-526-0272 or in New Jersey 201-592-0009.

	nd information g services.	n on your
Name		Title
Company	-	Phone
Address		
City	State	Zip
MON	I-LINE	Two Execution Drive



INTRODUCING THE SOLUTION. DATASTORE: lan.

The database management software that prevents costly data loss when several users share the same data.

Hardly anyone knows about it until it happens. And then it's too late. There's a collision. An entire database is destroyed. Vital records and information are lost. And untold dollars and man-hours are required to replace them. An entire business is thrown into chaos.

Why does database destruction occur? Because today's leading database management systems were designed for single users only. So when you have more than one employee accessing the same database, look out.

Happily, there is now a simple solution to this serious problem—DATASTORE:lan, the first software designed specifically for personal computer networks. DATASTORE:lan puts an end to data loss once and for all. And, it offers many other sophisticated database advantages as well:

■ SECURITY AND PRIVACY unheard of in single-user database systems. It permits selective access to sensitive information, screening out all those who should not

see it. You can even protect data down to the field and record level with DATASTORE: lan.

BUSINESS-SIZE CAPACITY for growth. It provides up to 16 megabytes of information per database with no limitation on the number of records, and each record can be up to 16,000 bytes with over 500 fields. In addition, there are 16 key fields, and you can join up to 15 different databases. Obviously, single-user systems pale by comparison.

■ EASILÝ COMPATIBLE. If you are currently using single user database management software there's no need to re-enter files when you upgrade to DATASTORE:lan. Compatible with leading database management software including dBase II™ and PFS:file.™

■ EASIER TO USE than virtually any other database product on the market. A step-by-step menu leads any user easily through the program.

AVAILABLE for IBM PC and compatibles, TI Professional and all leading networks including Corvus, 3Com, Nestar, Novell, Davong and PCnet™

If you don't want to gamble with your company's data, call us or write to find out more about DATASTORE:lan. Or stop in to Businessland, participating ComputerLands, Entré Computer Centers, or other major retailers.

For more information, a full-function demonstration disk, or the dealer nearest you, call toll-free:

1-800-LAN-DBMS

or 1-800-LAN-DATA in California.

Or write:

Software Connections 2041 Mission College Blvd. Santa Clara, California 95054

Name		
Address		
City	State	Z



THE FIRST NAME IN NETWORK SOFTWARE

CW 8



Size us up.

We solve tomorrow's computer problems today. EVERYWARE systems from Perkin-Elmer.

With so much at stake, your doubts about choosing the right computer system are well-founded. That's why you should take a look at the one family of computers that without a doubt offers everything you've been looking for: EVERYWARE systems from Perkin-Elmer.

The EVERYWARE family embodies a comprehensive merging of the world's major hardware, software and communication standards. A solution

for virtually every computing need. Ready to grow with you, while protecting your software investment and data integrity every step of the way.

A Comprehensive Family.

We offer one of the broadest choices of mutuallycompatible professional micro and supermini computers, easily integrated and supplemented as your processing needs change. Our Series 3200 32-bit superminis span a complete spectrum of computing capabilities with outstanding performance...from the compact, economical 3205 to the incredibly fast and powerful 3200 MPS. And all points in between.

The newest member of our family is the advanced, M68000-based 7350 super micro, bringing EVERYWARE systems to your desktop. With vivid color graphics. Windowing convenience. And



a choice of off-the-shelf applications softwareincluding word processing, spread sheets, graphics packages and development tools.

Operating Environment Flexibility.

Only EVERYWARE systems offer such diverse operating environment alternatives. Real-time processing under our proprietary OS/32 operating system. Reliance PLUS, our proven on-line relational DBMS that enables powerful, user-friendly transaction processing. The Resilient System, a new concept in fault tolerance that offers the high-availability advantages of two real-time, on-line processors while assuring 99+% uptime. Or time sharing. Or batch processing. Work in the environment that suits your needs. Or run any combination of them simultaneously through one powerful system!

To protect your single most important investment-the software-EVERYWARE computers offer a common operating environment derived from world-standard UNIX* software. Via FORTRAN and C, it's bridged to our OS/32 real-time operating system. That's the best of both worlds. And results in true software portability, from system to system, environment to environment.

Communications Everywhere.

We can share information with IBM environments via SNA and BSC emulators. Form a local network using Ethernet. Or communicate globally through the CCITT X.25/X.29 Packet Switching Network.

And that's about the size of it. Except to remind you that Perkin-Elmer is strongly committed to supporting your systems with complete customer training, worldwide service. . . and world-class products.

We invite you to "size us up" soon. For more information, return the coupon. Or call toll-free 1-800-631-2154. In New Jersey, 1-201-870-4712.

Tell me more about EVERYWARE Computers.

- Please send information on.
- Please have salesman call.

City

State

The Perkin-Elmer Corporation, Marketing Communications.
Two Crescent Place, Oceanport, N.J. 07757

CW81384 CW81384

EVERYWARE is a trademark of The Perkin-Elmer Corporation.
The Resilient System is a trademark of The Perkin-Elmer Corporation.
"UNIX is a trademark of Bell Laboratories.
IBM is a registered trademark of International Business Machines Corpo

The science and computer company. Where solutions come first.

IN DEPTH/WORTH THE RISKS?

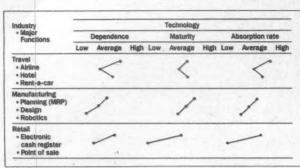


Figure 1. Absorption rate of three industries

logical absorption rate and status of the industry.

Measure and plot the risk/ change relationship for the organiza-

tion

Develop the organizational probability of success ratio (PSR) profile factors and measurements. Measure and plot the organiza-

Develop the organizational risk

management action steps.
One of the factors that many information system managers tend to overlook is the current level and dependence on information services technology in their industry. This industry absorption rate dictates the overall risk the organization faces from changes caused by information services technology.

services technology.

The absorption rate is based on two factors. The first factor is dependence — the depth to which technology is an essential component of the industry. The level of dependence can be determined by asking the question: What would happen if the plug was pulled on all information technology in the industry today? Maturity is the second factor —

the extent and sophistication with which the industry has adopted the technology. The level of maturity can be determined by asking the question: How close to the leading edge of information services technology is the industry?

The combined effect of these two factors reveals the breadth and depth of technology absorption in the industry. A high absorption rate generally implies that the information services in the industry are strategic technology directed (Figure 1).

The steps to develop a chart like Figure 1 are: identify the industry's major information and communications functions; rate them as to maturity and dependence; and plot the organization's position relative to the industry. The following questions should then be asked:

■ What are the applications of computers and communications in the industry today and in the future?

What is the combined absorp-

tion rate for the industry?

What are the direction, pace and momentum of technological change within the industry and the organization?

Is the organization behind or ahead of the industry in its application of technology?

Are there opportunities to gain a meaningful competitive advantage by leading the industry in information services applications?

■ Can we employ the technology to support a unique strategic thrust of the organization?

The result is a list of potential technological directions that will give the organization a leadership position or enable it to gain parity within the industry. Either of these results will entail changes in the organization and, thus, increase its exposure to risk. To assist in managing this process, the next step is execut-

Risk/change ratio

A successful strategy must achieve a proper balance between growth, control and technological innovation. Executives need to know the potential bottom line impact of the application of information services technology. The following questions are useful in this regard:

What is the current strategy for information services?

Have the technologies we use paid off?
Do they support the business or

drain its resources?

How do we compare with our

competition?

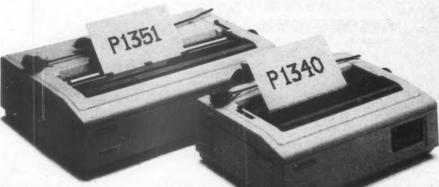
Are we spending the right

amount (too much or too little)?

Many factors affect the answers to these questions. Included are the technological dependence and maturity (absorption rate) of the industry and the organization; the focus of the organization's application systems — operational control, management control, strategic planning or decision support systems; the organizational maturity of the computer, communications, user and management team; the internal performance measurement systems of the organization; and the existing direction, pace and momentum of implementation.

Figure 2 shows the plot of a Fortune 500 company at the point when a new information systems management team was put in place (time x) and the same organization 24 months later (time y). In that 24-month

Two ways to show off your IBM PC.



There's no better way to show off your IBM PC – or any other micro – than with the new line of Toshiba printers. They offer state-of-the-art features, high reliability and low price.

P1351

The new Toshiba P1351 printer has a unique high-density 24-pin dot-matrix print head. It lets you print crisp, clean letter copy at 100 cps, draft copy at 192 cps. And with the software-selectable downloading fonts, you get to pick from a variety of type styles.

The P1351 has more stuff to show. Like 180 x 180 dots-perinch high-resolution graphics, 132-column-width platen (great for spreadsheets and Lotus™1-2-3™ data processing and graphics), Qume SPRINT 5™ emulation, and a choice of either a forms tractor or automatic sheet feeder.

P1340

For considerably less, the new P1340 gives you just a little less. But it still has the same high-density 24-pin dot-matrix print head, the 180 x 180 dots-per-inch graphics resolution, and the Qume SPRINT 5 emulation. In addition to true proportional spacing and a

built-in forms tractor.Whichever printer you choose, nationwide service within 24 hours by Western Union technicians is

So the choice is yours. But when you choose Toshiba, you know you're putting on the best show possible.

For more information, call toll-free: 1-800-457-7777, Operator 32.

IBM PC to P1340 and P1351 graphics utilizes PaperScreen and the IBM PC with color graphics adapter. IBM PC is a trademark of international Business Machines. Lotus and 1-2-3 are trademarks of Lotus Development Corporation. SPRINT 5 is a trademark of Quene Corporation.

SPRINT 5 is a trademark of Quene Corporation.

In Touch with Tomorrow

TOSHIBA

IN DEPTH/WORTH THE RISKS?

period the organization went through significant change. The vice-president of information systems started to implement a new commu-nications system within his company's field operations, converted from an early '70s-based computer opera tion to an '80s approach, revised the major business and information reporting systems and developed a new charter and role direction for the information services groups within the organization:

Case history

An initial analysis, utilizing the critical success factors approach, can identify four to eight items that have to go well for the organization to be successful. Here is a case history: A billion dollar organization had undergone a number of significant organizational changes. A new chief executive officer was installed, and several new strategic decisions were made.

Among these was the decision to utilize information services technology to provide the corporation with a meaningful competitive advantage. The successful information systems executive immediately started to change the way the organization related to the information services group and the MIS budget increased by more than 45%. However, new concerns were identified by the information systems executive, includ-

Senior management did not understand or support the MIS plans for computer hardware, operating systems, data bases, communications network and facilities.

The status of four major development projects, which accounted for more than 35% of the salaries in the current budget, was not known.

The decision to utilize outside

contractors to modify existing software resulted in a substantial expense during the prior four months

Several key weaknesses of the MIS organization and key user organizations were revealed. The main concern was the high turnover rate of important specialists.

With this information the information systems executive was able to identify six profile factors. They were: (1) a strong information services management and delivery team: (2) a high independence from external contractors; (3) a measured growth of MIS technology; (4) a successful modification of the user organizations' operational characteristics; (5) a well-implemented system development, implementation and operational methodology; and (6) a new capital prioritization, budgeting

and monitoring system.

Figure 3 provided an excellent communications vehicle showing where the executive's efforts had to be placed in order to minimize risk and to increase the probability of success. For example, although the information services team was experienced, it had not been with the organization long enough to absorb fully its culture. This resulted in an overall rating that was negative. The need for independence from the outside was the greatest problem. On the other hand, technological growth was normal, and the rate of change was within the overall optimal band.

Overall change management was low risk for the organization because a number of positive steps had been taken. The development methodology was at a normal level of risk, as was the capital budgeting, because of the control systems that had been put in place by the new information systems executive. These factors were then measured across all of the

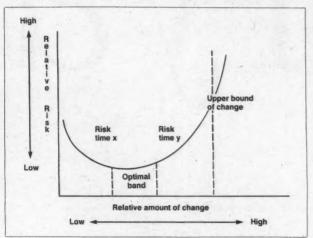


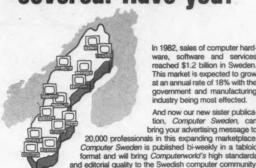
Figure 2. Risk/change relationship

Critical success factor measurement	Score	PSR profile		
		Worst (-1)	Even (0)	Best (+1)
MIS team	-0.1		_	
Independence	-1.0	- <		
Technology growth	0.0		1	
Change management	0.3			>
Development methodology	0.0	500	<	
Capital budgeting	0.2			>
Summation	-0.6	ELIO.	1	

Figure 3. Summary organizational PSR profile

SUCCESSIFUL FOR REAL ESTATE LENDERS **Automation Workshop** Computer Expo **Internal Management Conference** mber 18-19 New Orleans, Louisiana Program your company for the future by attending MBA's **Automation Workshop**, where you'll learn about the most successful computer applications for: Financial Planning and Accounting/Auditing Using Software for Loan Origination/Production and Osing John Servicing Planning Effective Management Information Systems Telecommunication Trends for Mortgage Bankers Your registration includes a pass to the industry's first Computer Expo—your best opportunity to make on-the-spot product evaluations. The Internal Management Conference will introduce you to current and future management techniques in corporate planning, accounting, tax, audit and internal control, personnel, finance, and additional topics in data processing Learn more by calling MBA at (202) 861-6590 Mortgage Bankers Association of America 1125 Fifteenth Street, N.W. Washington, D.C. 20005

We've got the Swedish computer community covered. Have you?



In 1982, sales of computer hardware, software and services reached \$1.2 billion in Sweden. This market is expected to grow at an annual rate of 18% with the government and manufacturing industry being most effected.

tion, Computer Sweden, can bring your advertising message to 20,000 professionals in this expanding marketplace. Computer Sweden is published bi-weekly in a tabloid format and will bring Computerworld's high standards and editorial quality to the Swedish computer community.

Its circulation includes managers, marketing directors, engi-neering management at computer hardware, software and service suppliers, educators, consultants, DP managers and technicians.

CW International Marketing Services is your one-stop advertising service in countries around the computer world. For more information about Computer Sweden or any of our other foreign publications, just fill out the coupon below.

Diana	La	Mu	agi	ia
-------	----	----	-----	----

Manager, International Marketing Services CW COMMUNICATIONS, INC.

375 Cochituate Road, Box 880, Framingham, MA 01701 (617) 879-0700

Please send me more information on:

☐ Computer Sweden ☐ Your other foreign publica

Name

Company

City

We can't do anything about your taxes. Or the rush-hour traffic. Or the person who keeps stealing lunches out of the office refrigerator.

But we can take a big load off your mind when it comes to diskettes.

3M diskettes are certified 100% error-free. And guaranteed for life.

No floppy is more reliable.

There's no way one could be. Because only 3M controls every aspect of the manufacturing process.

We make our own magnetic oxides. And

the binders that attach them to the dimensionally stable substrate. Which we make ourselves from liquid polyester. Which we make ourselves.

We also test our floppies. At least 327 ways. And not just on exotic lab equipment with perfectly aligned, spotless heads. But also on office equipment like yours.

We even reject a floppy if its label is crooked. Some people think we're a little crazy to go to all that trouble. After all, do you really need a diskette that can make one read/write



pass on every track, every hour, every day for the next 200 years?

Not really.

But now that you know a 3M floppy can do it, you can relax.

And worry about other things.

Like who stole your lunch from the office refrigerator.

refrigerator.

One less thing to worry about.

IN DEPTH/WORTH THE RISKS?

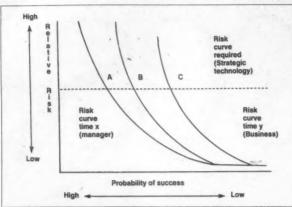


Figure 4. Probability of success

activities with which the organization was involved.

The information systems executive can develop a probability of success profile for his organization.

Looking at the risk curve in Figure 4 for time x (manager directed), the relative risk (horizontal line) at point A is the same as the risk of point B (business directed) and point C (strategic technology directed). The area of difference is the probability of success. For the same level of risk the probability of success is greater for the strategic-directed organization than for the manager-directed one.

In Figure 4, the organization was initially manager directed. You can see the direction that this organization took. With its previous management team (manager directed), the information services group did not

acquire the experience base needed to accomplish the company's objec-tives. For example, there were three failures in two years trying to implement a relatively simple distribution inventory control system. The company improved its position by adopting a business-directed strategy that helped it to relate inventory control problems more closely to strategic business units. The difficulty the company must now face is that its corporate objectives require it to become a strategic technology-directed organization and to use information technology to gain customer service advantage over competitors. This shift in strategy should also improve its probability of success.

With these factors considered, it is a reasonable task for an information systems executive to define the set of action steps required for his organization to gain competitive advantage. First, the executive needs to look at the absorption rate and review the systems that are the fo-cus of the "future leading competi-

This data can identify the new services a financial services organization is going to provide, the new products an office automation company plans to implement or the new directions a manufacturing or distribution organization can take to improve productivity. From this, a plan for the information services function can be created.

The information systems executive can identify his organization's risk/change function and identify the direction, pace and momentum necessary to achieve its plan. By reviewing the individual activities of the information services function, the executive can then identify spe cific steps required to change its PSR profile and meet its objectives.
Vice-presidents of information

systems can succeed and help their organizations achieve a meaningful competitive advantage by developing a business strategy based on information services technology. This advantage can be translated into new market opportunities as well as the traditional cost-reduction sys-

For example, any information systems executive who looks only at a "simple" application of office automation and does not see potential new ways for linking it to the business strategy or his basic business units functions may be missing an opportunity. Companies that have prospered in these difficult times, for the most part, have been innova-tors. Many of them have implemented innovations in the information services area.

The process presented here is straightforward. The ideas are little more than a new application of good management practices. If you are to succeed in the next decade, you will need to manage risk, reward and probability of success.

About the author

M. Victor Janulaitis is president and founder of Positive Support Review, a Los Angeles-based management consulting firm specializing in technology and change management, risk assessments and information systems for Fortune 500 corporations. He has co-authored Managing the System Development Proces As an executive at IBM, Janulaitis helped develop the initial marketing programs for the IBM 370.



How To Protect Your

No matter how skilled you or your staff may be, there are still bound to be errors now and then.

But when another company hires you or your firm to perform a computer service for them, an error can have costly repercussions.

And you or your firm could end up responsible. For example, what would happen if someone's error causes one of your computers to issue more payroll checks than it should?

Or if a mistake in a computer's accounting program puts a halt to a client's business-as-usual

You don't need a computer to calculate that the lawsuit costs from errors such as these could be too steep to handle.

And you can't always rely on a "hold harmless agreement" to protect you either, because a court of law can invalidate it and find you liable anyway.

That's why National Union Fire Insurance Co. of Pittsburgh, Pa. is offering Electronic Data Processors Errors & Omissions Insurance. It's designed to protect fee-based computer service firms against financial losses from claims made against them for wrongful acts occurring during the performance of services for others.

One of the most comprehensive EDP E&O policies on the market today. Unlike some EDP E&O policies, ours isn't limited to covering data processing, programming, or software designing. It also covers consulting and providing advice and opinions.

What's more, National Union has been a wellknown and respected source for professional liability coverages for nearly two decades now. And that means you can count on our experience and stability to back up every policy we issue.

So remember: as the demand for outside computer services increases, so will the potential risks. Which means there's one error you can't afford to make-leaving yourself or you firm unprotected by Nationa Union's EDP E&O Policy.

ONCE AGAIN THEANSWERISAIG.

coverage from Natio	ormation on EDP E&O nal Union.
Name	Title
Company	The second
Address	
City	State & Zi

Dept. A. 70 Pine Street. New York, N.Y. 10270

(Policy provisions are only briefly highlighted here. Refer to policy forms for complete details.)



IBM is scouting for the most valuable of VARs: those with outstanding new ideas and a

VARs: those with outstanding new ideas and a great batting average.

If you re one of them, you could become a Value Added Remarketer of IBM products. And what could that mean to you?

First, IBM can add clout to your marketing efforts. For example, we can help with product literature, direct mail and business show support. To add to your skills, IBM offers a wide range of professional classes for VARs.

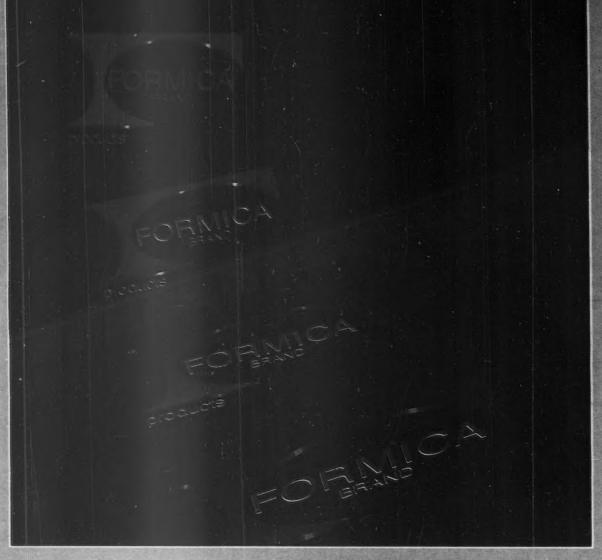
Furthermore, thanks to the online referencing system used by our own sales force, we can direct prospects with special needs right to VARs with appropriate solutions.

And, as one of the finest of VARs, you'll be selling the finest equipment; some of IBM's most competitive products. Our VARs can apply for the IBM 4300 systems, System/36, Series/1, System/38, the IBM Personal Computer and the System 9000 family.

To find our more about the advantages of becoming an IBM VAR, simply send in the coupon below or call 1800 IRM-VARS, Ext. 96

If you think your company can qualify, nows the time





Keeping Formica Corporation On Top "The integrity of Formica Corporation is very important to me. When we promise rapid delivery, we mean it," reports Gordon Sterling, President. "American Software's Sales Forecasting system belps us keep our promises and

maintain a high level of customer service by more effectively managing our inventories. Our investment in American Software's Sales Forecasting system has more than paid for itself... and I look forward to even more savings in the future." American Software can provide you with proprietary software packages for Sales Forecasting, Purchasing, Inventory, Manufacturing, and Materials Management. Plus extensive consulting help, and the training you need for successful implementation.

American Software: The Power of the Right Decision™



443 E. Paces Ferry Rd., Atlanta, GA 30305 (404) 261-4381

©1984 American Software, Inc

IN DEPTH

Information on the bottom line

By David R. Vincent

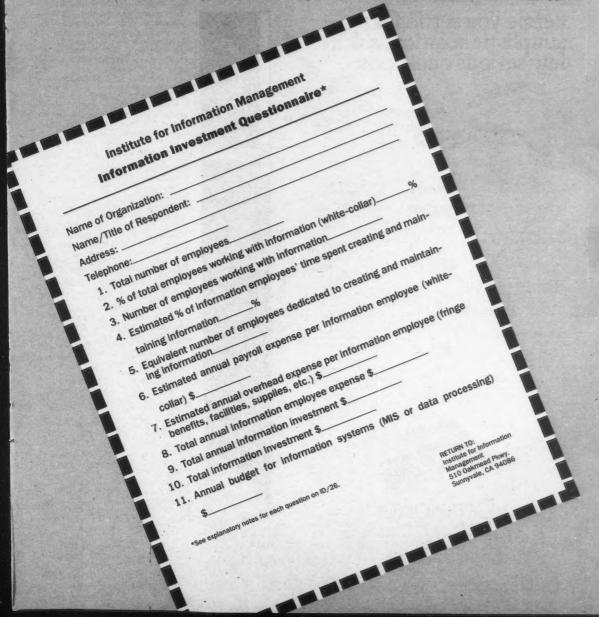
Information should be considered an economic commodity. In order for the information to be treated as a balance sheet corporate asset, its value must be clearly demonstrated. Investing in information must be shown to yield future revenues, a difficult point to prove. Evidence suggests that information systems play a key role in making information valuable.

The information investment, depending on the kind of industry, is actually much larger than estimated in my original In Depth article [CW, Sept. 26, 1983]. The new findings come from a survey of industries driven by information (banks, insurance companies and service organi-

zations) as well as manufacturing-based organizations.

The ratio of the information investment to the annual hardware/software expense relates somewhat to industry type. This ratio has value-added implications.

The questionnaire below was mailed to more than 2,000 chief executive officers. The net information investment was achieved by combining the total number of employees, the percentage of total employees working with information, the estimated percentage of information employees' time spent creating and maintaining information, personnel and related expenses such as benefits, payroll taxes, office costs and others listed in the questionnaire. The typical



IN DEPTH/BOTTOM LINE

information worker salary was about \$20,000 to \$25,000, with the related costs running from 80% to 100% of salary. These figures are especially significant when twothirds of the labor force may be em ployed as information workers over the next five years (Table 1). With a gross national product (GNP) of about \$3 trillion and gross national income of about \$2.7 trillion, that means that \$2.1 trillion, or more than one-third of the GNP, is being spent on information work.

Adam Smith's theory of economics, which traditionally views agriculture, manufacturing and service as the three labor divisions, must be modified to add a fourth: information. By lumping together pizza chefs, bank presidents and information workers, economists present a very warped and often dismal view

of our economy. Many even predict that we will become a nation of lazy "Big Mac" consumers rather than work hard to be more productive in those industries that can reduce our balance of payments deficit. Nothing could be further from the truth Silicon Valleys, Gulches and Prairies are springing up where relatively poor rural economies existed previ-

What is worse, economists ignore the impact of the information revolution. My concept of information economics recognizes the traditional components of current and fixed economic assets. However, as the labor force moves into information-intensive work, a new fundament for information investment must be used to make sound national policy based on the new labor utilization.

I am not suggesting that the U.S.

Aproxime		456				
Manuracturing	15	30				
Service		13				
Information						
Total	100%	100%	100%	100%	100%	5
				All some		

Table 1. Labor utilization

will produce fewer automobiles or basic materials as John Naisbitt suggests in Megatrends. I am saying that the labor component that has been required to produce manufactured goods will atrophy - a result of the automation that must take place to allow U.S.-produced goods to compete in a world economy with cheap local labor.

Consequently, exports from the

U.S. will contain a high element of technology, which can only be a result of redeployment of an adequately trained labor force. The current social upheaval and unemployment is, in part, due to this longer range redeployment.

Impact of shift

This shift from an industrial economy to an information-based econo my will have a major impact on the way that labor is utilized and the way that information-oriented output is valued. In the manufacturing environment, labor has traditionally been included in the cost of goods sold. Therefore, labor is matched by the inventory process with cash flow as manufactured goods are sold. This accounting reinforces the management emphasis on reducing the labor component in goods manufactured in the U.S. so that exports can compete in the world market.

On the other hand, the increasing investment in information workers (and equipment, facilities and so on) is treated as a routine expense item and is neither inventoried nor capitalized as is labor in the manufacturing environment.

Consequently, the benefits to be realized from the information

Note: If exact figures not available, supply estimated range.

1. Total number of employees includes all on payroll (including executive management).

2. Information employees generally include all personnel involved in the following areas: administrative; executive; marketing; manufacturing personnel involved with management, shipping, inventory and order entry; sales; engineering; finance; planning and control.

3. Multiply Items 1 and 2.

4. A rule of thumb for the effort dedicated to creating and maintaining information is 40% to 90% of total information employees' time, depending on the businesses' dependency on information.

5. Multiply Items 3 and 4.
6. Estimate the average annual salary per information employee (white-collar).
7. The associated overhead includes all fringes, Fica, office space and facilities, supplies, education, travel and communications. These generally run 80% to 120% of the base salary.
8. Sum Items 6 and 7.
9. Multiply Items 5 and 8.
10. It generally takes three to seven years to create a full information base. A rule of thumb is five years. Multiply the figure in item 9 by the number of years invested.





EVERYONE WHO WANTS TO USE THE COMPANY MAINFRAME RAISE YOUR HAND.

Introducing power to the people.

Better known as the Data Pipeline™ from Intel.

It's based on our iDIS™Database Information System. A powerful, integrated package of hardware and software with multi-user capability built right in. And now, through iDIS, just about any pc or terminal can easily share data with just about any mainframe.

With the iDIS Pipeline, you'll be able to
establish and manage your
pc-to-mainframe connections
in a way never before possible. Yet you'll still be able to
offer department users a
fair degree of independence.
Since iDIS comes with all

the software they need. Starting with the Xenix* operating system, built around a relational DBMS. Plus the Multi-

plan*spreadsheet, word processing, electronic mail, and a forms/menu development tool.

The iDIS Pipeline is powerful, too. Each one will handle 5 full-time users, or between 12 and 15 on dial-up. And you can even network with other iDIS systems. But you're always in control. You decide which data are

accessible, and extract only those to your iDIS system. Users then access their data sets from iDIS's hard disk.

Actually, using the iDIS Pipeline is a lot like giving users their own little mainframe. Which is a lot better than giving them yours.

It's also a lot cheaper.
Less than half the cost of a direct pc-to-mainframe connection.

It's also fully supported and serviced from one responsive source. Us. Best of all, it's available now.

For more information about how our iDIS Data Pipeline can help you manage the revolution in your office, call us at 800-538-1876; in California, 800-672-1833. Or write Intel, Lit. Dept. H-18, 3065 Bowers Ave., Santa Clara, CA 95051.

Of course, if you're undecided about what to do you can always ask for a show of hands...



IN DEPTH/BOTTOM LINE

investment may or may not be matched with revenue. This causes management to make decisions based on a profit squeeze in the current period and discourages management from investing in proper, top-down, decision-oriented, information-based systems that will favorably impact the return on investment over time.

The net result is that information-based systems are typically implemented on a piecemeal, ad hoc basis with little thought to the real value of the long-term information investment. A current example of such dubious accounting practice is the expensing of all software development in the current period — disregarding the fact that the application (or marketable product) may have substantial impact on future cash flows, yet little or no current benefit.

This extreme conservatism on the part of the accounting community is analogous to the expensing of all
manufacturing labor in the
current period, even though
substantial inventories may
be built for sale in future
fiscal periods, and extensive
plants and facilities may be
built for future use. The discipline of analysis and valuation of the information investment (as with other
traditional assets) is the basis for information economics.

21 trillion pages of information stored in desks, files and archives. This information is not automated. The annual growth rate for this kind of stored "information" is about 20%. If this is the way that the information investment is being made available to information workers, then

Stored information
In a recent study, Kodak
Corp. claimed that there are

to information workers, then it is no wonder that the accounting community can't place a value on it. The value of information can only be determined when it contributes to organizational productivity. This can only be done with automated infor-

mation systems.

Not all information has value. If information does

value. If information doesn't satisfy the need of the information worker in the productive performance of tasks critical to the larger organization, it is worthless. Too much information can be worse than not enough. How might a company go about determining if it is spending the right amount on information systems or too much on information — in other words, does it have too many information-generating

The goal of the research described in this article is intended to start the process of answering this question. Those companies wishing to participate and receive in-

dustry-specific results may complete the questionnaire on ID/26 and return it to Institute for Information Management, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Of 2,000 questionnaires sent out, only a small percentage were returned, some completed, some with just a note that this information was not available or that it would take significant study to develop such statistics. I interpret this to mean that

top management is unaware of the implications of information work.

A total of about 50 completed questionnaires were received. Some could not be used because of missing data elements. One had calculated an information investment of \$273 million with a mere \$90,000 spent on information systems. This yields a ratio of more than 3,000:1 (the amount reported wasn't enough to produce the payroll; obviously, much of the

An example of such dubious accounting practice is the expensing of all software development in the current period—disregarding the fact that the application may have substantial impact on future cash flows, yet little or no current benefit.



Hewlett-Packard research has used inkjet technology to make the ThinkJet personal compopular

puter printer surprisingly quiet while printing 150 high quality, dot-matrix characters per second for text or graphics. The ThinkJet printer weighs only 6½ pounds and it takes up just a bit more room than your telephone. So, it can work right on your desk. There's even a battery-powered model that lets you print anywhere. And, the ThinkJet printer's ink supply and printhead are designed in one neat disposable unit that simply clicks

out when it's time to change.

The ThinkJet printer will work with most popular personal computers, including Hewlett-Packard, IBM,® COMPAQ,™ TI,® or Apple IIe.®

Finally, as quiet, fast and compact as the ThinkJet printer is, it still has one more feature that's going to cause a commotion; its price... \$495.00*

See the entire family of personal computers, software and peripherals at your authorized Hewlett-Packard dealer.

Call (800) FOR-HPPC for the dealer nearest you.

Setting You Free

PG02409 282 W

HEWLETT PACKARD

IBM is a registered trademark of International Business Machines Corporation. COMPAQ is a trademark of COMPAQ Computer Corporation.
TI is a registered trademark of Texas Instruments, Inc. APPLE is a registered trademark of Apple Computer, Inc. *Suggested retail price.

information systems expense is buried in such things as banking services).

Another 41 companies sent their annual report, allowing some additional observations to be made coupled with interviews with their senior management. Like many research projects, the pure "scientific method" did not lend itself easily to conducting the study. Therefore, a fair amount of conjecture and intuition were used in evaluating the results.

Not all information has value. If information doesn't satisfy the needs of the information worker in the productive performance of tasks critical to the larger organization, it is worthless.

These are often called "partly baked ideas." At least they are a start in an area of investment that so far has

been almost entirely ignored. The results were dramatic. Some companies reported that as much as 80% of their

payroll and related overhead costs were spent on creating and maintaining information. One of the world's most successful information-driven manufacturing companies estimated that its information investment might be as high as \$45 billion.

Due to the confidentiality of the survey information, specific companies are not listed in the findings. Rather, the results were combined into two basic categories. As more responses are received. industry-specific statistics will be more meaningful. The two basic categories are:

1. Information-driven companies. These include banks, insurance and service firms and two informationdriven companies that include significant manufac turing of information

equipment and software.

2. Manufacturing compa nies. Even though there are some significant companies that stand apart from the norm of manufacturing. there was enough consistency to include all of them as a group.

Other studies

The responses from the questionnaires were consistent with a study done several years ago that appeared in MIS Quarterly, September 1981. In this paper, Franz Edelman, who was then RCA's vice-president, Business Systems and Analysis, put forth some statistics from RCA concerning the cost of information.

The study, conducted in 1978, was confined to RCA and took a slightly different view of the "information worker" from those currently used by John Naisbitt in Megatrends or Alvin Toffler in The Third Wave. However, Edelman's statistics were easily modified to resemble more closely the approach taken here.

An even earlier study was conducted by Paul A. Strass-man. Titled "Managing the costs of information," it was published in the Harvard Business Review, September-October 1976. In this study, the ratio of information investment to the annual ex-pense of DP ran about 88:1 based on some restructuring of the data. This is consis tent with the fact that at that time most systems were purely production batch-oriented.

In Edelman's 1978 study, the statistics for RCA indicated a ratio of about 53:1 based on some restructuring of the data to match the methodology used in this article. RCA at that time had moved into the interactive systems mode for some of its applications, However, RCA was at the beginning of this endeavor, and significant changes were anticipated. Edelman retired shortly thereafter, and more recent statistics are not available.

In summary, Edelman's and Strassman's studies showed that in the 1970s. information systems investment had been 88 and 53 times the hardware/software annual expense, respectively.

The results of the survey, shown in Table 2 on ID/30, included 27 valid responses. 11 from information-driven industries and 16 from manufacturing-based organizations. Although this is a very small sample, the results



00417 282 W

Setting You Free

where it came from.

for the dealer nearest you.

IBM is a registered trademark of International Business Machi

*Suggested retail price.

See the entire family of personal computers,

software and peripherals at your authorized Hewlett-Packard dealer. Call (800) FOR-HPPC

indicated a trend in the ratio between the amount invested in information and the annual expenditure on hardware and software. Of the companies responding to the survey, the following are the summary results:

Table 3 was based on a much larger sample size and includes the survey respondents and where the information investment was calculated; the information systems budget was not available.

Major influence

These large investment numbers were influenced heavily by two major information-driven firms that had \$15 billion and \$45 billion invested in information respectively. On an informal basis, the ratio between these figures and those of the information systems annual budget

were comparable to the ratios calculated from the survey results.

The manufacturing side was simi-

The manufacturing side was similarly influenced by four firms with an investment in the \$5 billion range. Again, on an informal basis, their management indicated that the ratios from the survey sample reflected approximately their ratios.

The first step toward determining the value of the information investment is ascertaining the business reason for the collection of information. The second step is to assess the ability of the information-handling system to provide the right information (as determined by the first step) at the right place, at the right time, in the right form and in the right ouality.

The degree to which these two steps are satisfied in the key areas that determine success or failure of

	Information-driven Industries	Manufacturing industries
Average information investment Annual expense	17.6:1	35.7:1
One standard deviation	11.8	25.7
Number of companies	11	16
Average information investment	\$200 million	\$850 million

Table 2. Information investment vs. annual information budget

	Information-driven Industries	Manufacturing industries
Average information investment	\$4,200 million	\$1,200 million
Number of companies	37	31

Table 3. Average Information investment



SECURITY, NATURE'S WAY.

Our Security System Does Something Nature Doesn't Do. It Protects Your Data.

Only one security software is the accepted standard for IBM MVS, VS1, and VM environments: ACF2, The Access Control Facility.

Over 1200 organizations, including many Fortune 500 companies, trust ACF2 for access control because it gives peace-of-mind against unauthorized disclosure, modification, or destruction of data.

With ACF2, all data is protected automatically — by default. Authorization access is granted based on a need to know. This avoids confusion, assignment mistakes, and oversights.

Installation is fast. Implementation is painless. Critical data sets can be protected first, while less critical data can be secured in stages to avoid disruption of daily work routines.

All system resource accesses are monitored and controlled as they occur. A complete audit trail provides total accountability.

Surprisingly, all this control uses a minimum of administrative and machine overhead.

So if you would like to see how naturally ACF2 can blend into your data center, please call or write The Cambridge Systems Group for more information. an enterprise must be assessed. Ultimately, the value of the information investment and the added value provided by information systems can be derived by measurement of resultant future cash flow.

Some industry sectors are especially driven by information. Specifically, their only product is a service. These are the firms that were designated as "information-driven" companies in the survey results. They include:

- Banking and financial services.
 - Insurance and security services.

 Most government agencies.
- Marketing and sales organiza-
 - Accounting and auditing firms.
 - Software development firms.
 - Investment houses.

The most common characteristic of all the above businesses is that their end product is based on the judicious use of information. They are also intensive, rely heavily on information systems and the results of their efforts are either read, heard or recorded for future access.

Haphazard process

In good times, little thought is given to the fact that useless infor-mation may be created or vital information may be missing. As long as profits and/or return on investment goals are met, the information investment remains latent. In times of economic stress, companies reduce payroll costs in order to protect the viability of the enterprise. No correlation has been made between the value of information and payroll expense. Therefore, the process of weeding out nonvital costs is haphazard at best. The conscientious valuation of information is a necessary practice in both good times and bad. The process of studying the re-lationship of the information investment to the amount expensed annually for information systems is the first step based on the following

methodology:

Step 1. Goals and objectives. The beginning points of valuing information for an enterprise are the goals and objectives of the business. These goals include obtaining greater market share, increasing revenue and profit (and, ultimately, return on investment) and expanding into new markets and ventures.

Most enterprises have goals and objectives that have been set at the highest executive level. Coupled with these goals and objectives is a handful of business areas that must have positive results in order to achieve the goals and objectives.



The Cambridge Systems Group

24275 Elise, Los Altos Hills, CA 94022, U.S.A., (415) 941-4558 • Teler 357437

Because the goals deal with the future growth of revenue, profit and return on investment (future cash flow), the investment made to achieve positive results for those business areas may be classified as a deferred expense or asset. The investment made in information and information systems plays a vital role in achieving positive results.

Let's take a look at an example of the process involved with establishing those areas needing positive results (critical success factors) to achieve a goal of doubling revenue and profits every five years. Business areas for a bank might:

■ Offer the most complete line of

Offer the most complete line of financial services and conveniences for multinational corporations and consumers.

■ Implement simplified loan processes to encourage more use of this bank.

Give personalized and custom service to make customers feel that they are not being treated as numbers.

Make sound financial investments to optimize return on investment

Maintain cost-effective operations so that rates for services may be highly competitive.

Step 2. Determine what information is necessary. The next step is to ascertain what information is necessary to achieve positive results of the critical success factors. Continuing the above example, the investment in the information asset for the banking business that would be needed would require the following steps:

B Create a complete information base on multinational firms, the locations of every part of their operations and affiliates, financial and tax status and probable needs and the names, titles and some personal information about all key executives and contacts. Include complete records on which competitor is now meeting those needs and the history of any problems or stress in any of those relationships. Create complete subject information bases on all current and prospective multinational bank consumers: their habits and preferences, their behavioral financial history and their demography.

■ Automate the loan process so that loan officers need not have the applicant fill out a financial statement. (There is already sufficient data to determine credit worthiness: Provide the customer with a simple process to create loans (Visa or Mastercard) and provide loans through fraternal and civic organizations.

© Create a subject information base to ascertain which banking services are used and preferred by each individual bank customer. Include any past problems, solutions and open items to ensure that all customers can call in at any time, and the necessary information will be available to a bank employee contacted by a customer. The bank employee will have access to the appropriate history of the customer and can treat that customer as an "old friend" of the bank.

Maintain complete subject information bases on all forms of financial investment, their historical behavior and complete analyses of economic and business events as to their impact on any present or possible future investment. Create the capability to advise bank customers who have vested interests in any

particular investment as to past, current and future prospects of the quality of the investment.

Eliminate any information bases that are not required by law or necessary to achieve positive critical success factors. Consolidate all bank planning activities for the planning of the business, the information asset and the planning of information technology. Integrate these as a single cohesive effort.

This process bears a strong relationship to the Business Systems Planning methodology promoted by IBM. This was a critical success factor in establishing the information resource plan at the World Bank — a leader in implementing this methodology in a pragmatic manner. It is also significant that the World Bank has a chief information officer, Mel

Step 3. Creating the information bases. The investment to create the above information bases will be sub-stantial. In all likelihood this information will be created not as a corporate information investment, but as a splintered effort of various data ases "owned" by the various bank ing departments, with provincial guidelines on who has access to the data. A preferable strategy would be to recognize this investment as a corporate investment with segmented custodianship by the operating groups who use and maintain a particular information base. This process has recently been overcome at the Wells Fargo Bank by its chief information officer, Jack Hancock

The valuation process, the useful life of the asset and the future costs of maintenance should be planned at the time of the decision to create the

information base. The basis for estimating the amount of the investment to be made would include all labor and information technology costs (data collection methods; hardware, software and communications systems acquired; and application systems created).

This investment is being made to create future net cash flow. It is for the exclusive use of the bank. Great lengths will be taken to ensure the security of the information, and the bank will finance the investment out of its own internal funds. The bank has created what in future years might be considered a capitalizable asset — and it deserves to be treated as such.

The investors in the bank deserve to know the amount invested in these kinds of projects. Likewise, the information systems planners need

Microcomputers contribute more when they have mainframe power.

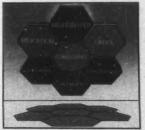


Compatibility between mainframes and micros has continually challenged experts in information services. But now Boeing makes this dynamic combination of power and convenience and everyday fact of computing life. The result: unprecedented productivity.

We call this powerful breakthrough MAINSTREAM® Distributed Services. For example, our Business Management Workstation combines the new IBM®PC XT/370 with our EIS® (Executive Information Services) Decision Support Software. You can perform functions like modeling and report generation on the PC XT/370, which simulates a System 370 mainframe. And you can switch instantly to your multi-dimensional data base via MAINSTREAM teleprocessing. For those not requiring the full functionality of the EIS software at the desktop, we also offer the EIS Micro

Workstation, which lets you download, manipulate and upload data between your IBM PC or PC XT and the MAINSTREAM service.

Because both workstations have Value-Added Dealership (VAD) agreements with IBM, Boeing is your single source for hardware, software, host processing, education and training, and support.



Our Micro/8410 brings this powerful micro-mainframe combination to structural engineering. The Micro/8410 lets engineers formulate and reformulate on the MDX 11 microcomputer. And then quickly upload to IBM, CYBER or CRAY mainframes for detailed calculations using any of the most popular design packages. These distributed services are all part of Boeing's approach to complete, integrated information services. Enhanced remote computing services. Distributed processing and micro/mainframe links. Office information systems. Software solutions. Education

systems. Software solutions. Education and training. And a variety of professional support services. For more information or the location of the sales office nearest you, call toll-free 1-800-447-4700. Or write BOEING COMPUTER SERVICES, M.S. CV-26-17B, 7980 Gallows Court, Vienna, Virginia 22180.

BOEING COMPUTER SERVICES

The Boeing Company

Boeing is an authorized Value Added Dealer for the IBM Personal Computer, Personal Computer XT and Personal Computer XT/370.

IBM is a registered trademark of International Business Machines • ElS and MAINSTREAM are registered service marks of The Boeing Company.

The investors in the bank deserve to know the amount invested in these kinds of projects. Likewise, the information systems planners need to be integrally involved in this process.

to be integrally involved in this process: It will be the information systems that will make it all possible. Most leading-edge banks have hightechnology groups to assess how new information systems technology can be used to serve a strategic need.

At present, the information and information system investments are simply buried in "operating ex-pense," with a resultant reduction in current earnings. Because of this kind of accounting, unenlightened banks, in attempting to maximize

profit or return on investment, will not undertake the full and complete program necessary to survive in the long run. Rather, they will force information systems to patch older, less efficient and incomplete information-handling processes. The end result will be reduced future revenues, reduced profits, low returns on equity and, quite likely, a new bank president or merger.

The basis for valuation of the information investment and the attendant information system investment

should be conducted just as any other "construction" project such as the completion of a building. The accounting principles for construction are standard project accounting principles: The value of the building is established as the total cost of the project, including material, labor and overhead. The building's ultimate value will be determined by the rents produced.

Bank of America

This same process is being used by the Bank of America in restructuring the way that it handles interactive processing with its customers. Executive Vice-President Max Hopper is using information technology to gain a competitive advantage by providing additional revenue-generating services (including the bank's use of the Airline Control Program that he

successfully used at American Air-

lines).

The valuation of the information base as an asset may be valid, but it also contains risk — the risk con-tained in valuing any asset. The foundation of the building might be inadequate, and the government au-thorities might rate the building uninhabitable. An inventory of pre-cious metals may be written down in a future period because the market price has fallen drastically, or an electronic component carried at some high value in inventory might be rendered obsolete in the next year.

An investment in information might not achieve the desired effect on critical success factors. However, it is the job of management (later audited by the DP auditors and fi-nancial auditors) to determine the risk associated in making any significant investment

Ultimately, the financial community will agree that if an information investment affects a critical success factor, then it merits valuation as a true corporate asset.

An easy step for the accounting of information would be to measure expenditures on information as research and development expenses. This would result in an initial step of a new expense category on the profit and loss statement: information. This is the way information investments were treated in the survey

conducted for this article.
For those not wishing to modify their profit and loss statements, at least a footnote to the financial statements is in order. With the recognition of an information "expense" including all the above components (labor, overhead and technology), the auditing staff can determine the effectiveness of this new expense category and whether the value added by information systems is being optimized. Validating the effectiveness of this expense will lead to the question of how to benefit future cash flows (revenue) by optimizing the investment in information and realizing its value with sufficient information systems.

The auditors must also search for the answer to another vital question: which critical success factors are not supported by an investment in information. Perhaps the lack of an ap propriate information base constitutes a real concern for top management. Can you imagine a scenario where critical information was neither created, maintained nor available because the information systems group (often reporting to the chief financial officer) was an undesirable expense that should be heavily controlled so that it doesn't get out of hand?

The Institute for Information Management will continue this research and has developed a program to assist management and corporate analysts in understanding the interaction of the information and information system investment and orga-nizational productivity.

About the author

David R. Vincent is general manager of the Institute for Information Management. He is vice-president of Boole & Babbage, Inc. Vincent has more than 20 years of financial, accounting and information man agement experience and has managed firms in 15 countries. He is currently writing a book on information economics.



WE'VE KEPT MORE THAN 800 VERY LARGE COMPANIES VERY HAPPY. BY LEADING THE LEADER.

Our customers know one thing very well: they can count on NCR Comten 100% of the time.

It's important that we're the leading manufacturer of IBM compatible data communication systems. We conanually lead the leader: our users get more system intelligence. More reliable software. Better service. And a business partner that stands beside them.

As a result, users are comfortable with their NCR Comten data communication systems. Oil and computer companies. Telephone companies. Manufacturing companies. More than 800 of them worldwide. Wherever the flow of business, industry or government depends on the certain flow of information, our customers depend on us.

Customers who choose NCR Comten stay with NCR Comten. To find out why, ask for our executive briefing. Write "Data Communications Systems," NCR Comten, Inc., 2700 Snelling Av. N., St. Paul, MN 55113. Or call 1-800-334-2227.

KNOWN BY THE COMPANIES WE KEER

NCR NCR Comten, Inc.



Look-alikes: Only the unique survive

here is an interesting dichotomy that results from the ready availability of off-the-shelf components like semiconductors and microprocessors.

On one hand, the fact that virtually anyone can purchase the components necessary to build a computer system gives small entrepreneural companies a rare chance to break into the highly profitable high-tech marketplace. On the other hand, easy access to so-called standard components makes it incredibly easy for start-up firms to produce look-

alike versions of successful products.
Perhaps the classic example of the latter case is the microcomputer industry. Based on the early success of companies like Apple Computer, Inc., many companies (both big and small) decided to jump on the microcomputer bandwagon. IBM, for example, created the highly successful Personal Computer line from components purchased from other vendors. And as everyone knows, the result was a flood of smaller companies making IBM look-alike microcomputers. It got to the point where there were well over 100 companies making microcomputers. That was until the washout started. Now, microcomputer companies appear to be dropping like flies.

Graphics workstation mart

The same thing appears to be happening in the graphics workstation market. In the past six months, Computerworld has published, on the average, three new graphics workstation product announcements each week. Each of the companies that has unveiled graphics workstations is convinced it has hit upon the approach to graphics. Many of their stories sound suspiciously alike, however.

Undoubtedly, some vendors of graphics workstations will be highly successful because they really do have a unique, innovative approach to computer graphics used in applications like computeraided design and manufacturing and printed-circuit design.

Others, however, unfortunately are doomed to drop by the wayside, mainly because they are offering look-alike or "me-too" products.

From the business aspect, the fact that some companies succeed and others fail is a fact of life. Entrepreneurship, while it offers the potential for phenominal success, also carries the threat of abject failure.

From the user's standpoint, the flood of very similar products can be abysmally confusing. Not to mention the threat that many smaller companies may wind up going out of business, possibly leaving the owners of their products out in the cold.

Like the microcomputer business,

Like the microcomputer business, there will be a washout in the graphics workstation market. The victims will most likely be the companies that have failed to take an innovative approach to designing a graphics workstation.

MDS Quantel offers top-end addition to supermini family

By Tom Henkel

HAYWARD, Calif. — MDS Quantel, Inc. has unveiled a top-end addition to its line of superminicomputers called the System 264. The system consists of a 16-bit CPU plus a 64-bit memory interface that is said to handle instruction fetching and encoding.

ing.

The system is said to offer twice the internal throughput of the firm's older System 64, which was announced in 1982. A spokesman said the speed increase is largely a result of newer circuit technology used in the System 264. The System 64, however, is still being marketed, the spokesman said.

Claiming the System 264 offers internal

performance of roughly 1.5 million instructions per second, the vendor said the System 264 offers a maximum main memory capacity of 16M bytes and a disk storage capacity of 1.4G bytes. The System 264 features a CPU cycle time of 100 nsec and a memory cycle time of 200 nsec. It can support up to 16 I/O control units, the vendor said.

All current Quantel systems are fieldupgradable to the System 264, the vendor said. A spokesman said the least extensive upgrade, a series of board changes to convert the System 64 into the System 264, costs annoximately \$30,000.

costs approximately \$30,000.

The System 264 is said to be compatible with Quantel's Best operating system and See MDS page 90

Symbolics, Inc. unveiled a 32-bit color graphics system that uses Lisp Machine, Inc. software/82

ments USA, Inc. enhanced its line of graphics terminals with a desktop model/82

INSIDE

Terminals/86

Printers/Plotters/87

Graphics

Systems/89

Power Supplies/92

Board-Level Devices/92

Four-Phase supermini add-ons debut

CUPERTINO, Calif. — Four-Phase Systems, Inc., a subsidiary of Motorola Inc., has announced enhancements to its 2000 family of communicating desictor

The enhancements include the addition of a Motorola 68010 microprocessor a virtual memory version of AT&T's Unix System V. operating system, a 52M-byte Winchester disk drive said to increase on-line storage to 369M bytes and a LM byte removable. Winchester disk, the company said.

The 2000 series is said to feature IBMcompatible batch and interactive communications using IBM's Systems Network Architecture and Binary Synchronous Communications and asynchronous protools.

The enhancements are available for the Model 240 and Model 260. In addition, a microprocessor is packaged with a 5M-byte removable media disk drive and a 15M-byte fixed media disk drive on the Models 240/3 and 260/3, the company

Envoy turnkey links micros, superminis

FRAMINGHAM, Mass. — Envoy Systems Corp. recently announced a turnkey system that integrates portable microcomputers and Digital Equipment Corp. VAX-11 series superminicomputers. The system was designed for use by sales personnel for medium-to large-size field sales organizations.

Called the Salesmate system, the unit uses 16-bit portable microcomputer workstations with a modular family of sales ap-

plication software that can be linked to a home office VAX-11 system via autodial modems using telephone lines.

The microcomputer is from Gavilan Computer Corp., and the sales application software was developed by Envoy. Communications are via Envoy's full-duplex protocol, and the central office minicomputer can be a VAX-11/730, VAX-11/750 or VAX-11/780. Branch offices can be See ENVOY page 91

Controller enhancements tout performance

LOUISVILLE, Colo. — Storage Technology Corp. recently announced three enhancements for its intelligent disk controller, the 8890 Sybercache.

Said to improve the performance of the data storage subsystem it controls, the Sybercache now offers up to 18M bytes of cache memory, an eight-channel switch and a special dual-frame configuration said to combine two 8890 units.

The 18M-byte memory, a field-installable option to be available in December, is said to support the expanded cache needs for the firm's 3880 disk drives and the company's 8350, 8360 and 8650 drives. Previously, memory in the 8890 Sybercache could be either 1.5M, 3M, 6M or 12M bytes, the company said.

The eight-channel switch, which allows eight channels to be connected to the Sybercache, is said to permit the disk subsystem to be shared by multiple processors. The switch will be available in December, the company said.

With the dual-frame option, two Sybercache units

can be interconnected. If there is a power interruption, the second controller is said to provide an alternate path to attached disks, the company said.

The dual-frame option is available to users of exist-

The dual-frame option is available to users of existing 8890 units and can be added as an upgrade at the user's site, the company said.

The 8890 Sybercache intelligent disk controller is said to improve I/O response time by as much as 75%, depending on the application, the company said. The improvement is accomplished by prestaging data in a solid-state memory, allowing computer access at electronic speed, the company said. Sybercache is said to be compatible with the IBM 4300, 370/135-168, 30 series or equivalent CPUs, the company said.

The 8890 also supports all IBM MVS, VM and DOS/ VSE operating systems and was intended for use with Storage Technology's 8350, 8650, 8360 and 8380 disk drives, the company said

drives, the company said.

More information is available from Storage Technology, 2270 S. 88th St., Louisville; Colo. 80028.

Symbolics offers 32-bit CPU-based graphics system

LOS ANGELES — Symbolics, Inc. has introduced a modular color graphics system based on the Symbolics' 3670 32-bit CPU. Using software developed by Lisp Machine, Inc., the unit is said to provide image generation and processing capabilities. The firm also announced optional graphics software packages for the system.

Available in September, the system is targeted to graphics production users such as broadcasters, post-production and special effects houses. The system's applications are said to encompass industrial and educational areas including comput-

LOS ANGELES — Symbolics, Inc. er-aided design and manufacturing, as introduced a modular color architectural design, training and raphics system based on the Symbographics research.

The color frame buffer is said to offer programmable resolution ranging from 640 by 480 pixels to 1,280 by 1,024 pixels. The color frame buffer is also said to offer two million pixels worth of memory, hardware pan and hardware zoom.

The Symbolics color graphics system offers a choice of either 256 pseudocolors of eight bit/pixel or direct color of 24 bit/pixel. A palette of more than 16 million colors is available.

The software options include: S-Paint digital canvas; S-Geometry three-dimensional data base, editor and displayer; S-Render three-dimensional rendering; S-Dynamics motion and frame recording control; and standard Symbolics packages, such as Fortran and the Macsyma symbolic mathematics system.

The system contains on-line hard disk frame and program storage and off-line archiving on ¼-in. cartridge or industry standard ½-in. tape or removable media disk, the company said. Nonremovable Winchester disks come in 167M-byte and 474M-

byte sizes, and a 300M-byte removable disk is available.

The basic system configuration includes the Symbolics' 3670 CPU with 4M bytes of main memory, the High-Resolution Pseudo-Color Frame Buffer, a high-resolution black-and-white bit-mapped console, a digitizing graphics tablet, a 167M-byte Winchester disk and a cartridge tape

The basic system costs \$130,000 in single quantities.

Symbolics is located at 1401 Westwood Blvd., West Los Angeles, Calif. 90024.

Seiko unveils desktop graphics terminal, 2414 enhancements Targeted toward scientific and engineering markets

MILPITAS, Calif. — Seiko Instruments U.S.A., Inc. has announced a desktop version of its D-Scan GR-2414 graphics terminal, called the GR-2424, and also a parallel interface and 16-million-color palette enhancement for the 2414.

Targeted to scientific and engineering markets, the 2424 is said to have a resolution of 1,280 by 1,024 pixels at a 60Hz refresh rate and 1,024 colors from the expanded optional color palette of 16.8 million, the vendor said.

Based on Zilog, Inc.'s 8-bit Z80 and 16-bit Z8002 microprocessors, the 2424 is said to feature the ability to expand to 10-bit planes. Display list memory is 1M byte, and the unit includes an RS-232 interface, the vendor said.

The GR-2424 costs \$16,950 and is available 90 days after receipt of order, the vendor said.

The company's enhanced GR-2414 terminal features a 16-bit parallel interface that is said to ensure compatibility with the Digital Equipment

Corp. VAX-11 family of superminicomputers.

Two logical devices can be used simultaneously on the 2414 via the RS-232 ports. The unit's terminals editor operates at 19.2K bit/sec while concurrently downloading images from the host through the parallel inter-

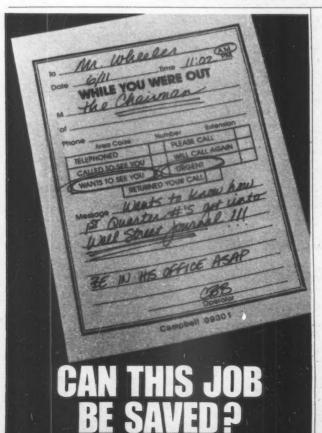
The enhanced color palette expands the 2414's standard 5-bit digital-to-analog converter (DAC) to an 8-bit DAC, extending the color palette to 16.8 million with up to 1.024

active colors, the company said.

Applications such as solids modeling and photographic-type imaging are supported by the extended palette, the company said.

The parallel interface option is priced at \$3,000, factory installed, and the GR-2414 is priced at \$15,950 in single quantities, the vendor said. It is also said to be available 90 days after receipt of order.

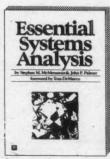
More information is available from Seiko at 1623 Buckeye Drive, Milpitas. Calif. 95035.



NEW FROM YOURDON PRESS!

The Definitive Book On Systems Analysis

Essential Systems Analysis, written by practicing analysts Stephen M. McMenamin and John F. Palmer, is for all project managers and systems analysts. It includes complete explanations of the most up-to-date tools and strategies currently available to DP professionals involved in the process of systems development. With 200 easy-to-follow diagrams, and many examples from actual experience. An article introducing the concepts described in Essential Systems Analysis is featured in the In-Depth section of this Computerworld.



ISBN: 0-917072-30-8; 408 pages; \$28

YOURDON PRESS, 1133 AVE. OF AMERICAS, NYC 10036 (800) 223-2452, Ext. 3328 or (212) 391-2828, Ext. 3328

More and more. For less and less.

Hewlett-Packard introduces the HP 2392A.

When you get this new HP display terminal, suddenly you'll be running applications



with less effort. In less space. For less money. And with more confidence, having HP's reliability and quality to count on.

Less effort.

The first thing that will impress you is how easily everything fits into place. Integral tilt and swivel make screen and keyboard adjustments easier. Power and brightness controls are right up front, at your fingertips.

Working becomes
more pleasant, thanks to
the non-glare,
high-resolution
screen and well defined, smooth scrolling characters. Up to
four pages can be stored
in display memory, with
up to four more pages
available as an option.

And all that happens on a 12-inch display that only takes up about one square foot of your desk

More helpful.

With eight non-volatile, programmable function keys, it will take you

less time to enter complex or repetitive commands. A handy terminal status line tells you what modeyou're working in. And

national language key-boards are available to make work easier for everybody, just about everywhere.

You get more speed, too. You'll communi-

with your computer at up to 19,200 bps in block, line or character mode. So your information will get around in less time. It's also easy for you to get hard copy, since our terminal has an optional printer port you can install yourself.

If you're an ANSI user, you've also got more going for you. The HP 2392A has ANSI capabilities making it an ideal terminal for your DEC system.

More reliable.

HP engineered the HP 2392A using state-of-the-art VLSI technology to minimize component count and increase reliability.

But, if you do need support services, just pick up the phone. A worldwide network of HP sales and service offices is staffed by qualified engineers ready to help you.

Less money.

With all these features, you'd expect to pay more than \$1,295* for our new display termina

play terminal. But that's all we're asking. So why settle for less?

To get more information, call your local HP sales office listed in the white pages. Or get in touch with Terry Eastham, Hewlett-Packard, Dept. 003199, 8020 Foothills Blvd., Roseville, CA 95678. Phone (916) 786-8000. In Europe, con-

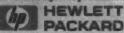
tact Sept. 1. 1295

AND THE MINORED AND AIM

15 10 700 18 9 215

Michael Zandwijken, Hewlett-Packard, Dept. 003†99, P.O. Box 529, 1180 AM Amstelveen, The Netherlands.

Productivity. Not promises.





Coming up with a better printer than our existing model 40 was no easy task. Especially when you consider its reputation

for outstanding reliability.

So in designing the T300, Teletype Corporation's primary goal was to add more features without sacrificing reliability. What we've come up with is one of the most flexible printers available. One that offers a great value and should even surpass the reliability of our model 40.

You see, we've added a microprocessor-based controller for increased capability. We also replaced complex mechanical assemblies with MOS/LSI circuitry that adds to reliability. The result the T300 withstands the abuse of our rigorous testing that includes printing 500,000 full lines over a 16 hour period.

On top of greater reliability, the T300 is also easier to use. Instead of flipping DIP switches,

On top of greater reliability, the T300 is also easier to use. Instead of flipping DIP switches, the operator conveniently enters options from a keypad. A 4-digit LCD display verifies entered options and provides printer status information.

We've also given the T300 an appealing type font. You can choose popular fonts including "Prestige Elite." There's even a new stylized tabletop cabinet that helps minimize noise.

The T300 is available with an RS232C interface, operates at up to 9600 bps, and prints up to 300 lines per minute. The serial interface has a 2000 character buffer which helps handle a heavy burst of data. The T300 is also available with a Centronics parallel interface. The printer adapts to many OFM applications and is compatible with popular mini-computers.

Another T300 plus is that it handles virtually any business form, from small labels to wide format computer reports. It also features electronic VFU. You can program and store up to five different formats that can be down-line loaded, or invoked locally.

Self diagnostics on the T300 help prevent unnecessary service calls. But in the unlikely event it needs repairs, you can count on our established nationwide service organization.

We admit it was a tough act to follow, but wed bet our reputation on the T300. For more information, write Teletype Corporation, 5555 Touhy Ave., Dept. 3223-F, Skokie, IL 60077. Or call 1800 323-1229, ext. 305.





ARD WELLGIVE YOU A At Teletype Corporation, we're convinced you'll think the T300 is one of the best line printers PRINTER FOR A ever built. And we figure the best way to convince you is to let WEEK TO PROVE IT. So if you qualify, we'll deliver a T300 to your all. If you like the T300, and we're sure you will, you can keep the unit by purchasing it from the authorized distributor nearest you.

To take advantage of this offer, call toll free 1 800 323-1229, ext. 305.



TERMINALS

TELEX COMPUTER PRODUCTS, INC. 1186 Intelligent Workstation

Telex Computer Products, Inc. has unveiled the 1186 Intelligent Workstation, which the vendor said allows users of 3270 terminals to use most software developed for the IBM Personal Computer.

The 1186 can operate as a stand-alone local processor, pacity, or a 10M-byte hard

using Microsoft Corp.'s MS-DOS operating system, or as an on-line 3270 display station for host interaction. Its coaxial feature optional board enables users to support 3270 host access for applications requiring on-line capabilities.

The 1186 uses an Intel Corp. 80186 microprocessor. It is offered with either two dual-sided, double-density floppy disk drives, each with 360K bytes of formatted cadisk drive with a single floppy disk drive.

Memory capacity for the 1186 ranges from 128K bytes of random-access memory (RAM) and 32K bytes of read-only memory to an extended capacity of up to 512K bytes of RAM.

The 1186, which supports a monochrome display, also supports a color monitor without the addition of a feature board.

The 12-in., nonglare dis-play features tilt-screen ca-

pability and is available in either green or amber phosphor. Standard features include two serial ports and

one parallel port. The 1186 is priced at \$3,025 for the model with two floppy disk drives, 128K bytes of RAM and an MS-DOS operating system. The 1186 odel with a hard disk drive, 256K bytes of RAM and MS-

DOS is priced at \$4,980. Telex Computer Products, 6422 E. 41st St., Tulsa, Okla.,

ATHEMATICA

PRODUCTS GROUP

MATHEMATICA PRODUCTS GROUP
P.O. Box 2392, Princeton, NJ 08540

DATA SYSTEMS

COMPANY

TANDY CORP. DT-100

Tandy Corp. has intro-duced the DT-100, an Ansi 3.64-compatible display terminal, and a 9,600 bit/sec se-

rial-to-parallel converter.
The DT-100 is said to offer ergonomic design and software compatibility with Digital Equipment Corp. VT100 terminals. It also reportedly features a built-in serial printer port with programmable transmission rates, a 14-in. screen character set and a keyboard with DEC VT220-compatible editing keys and 16 programmable function keys.

Also reportedly included in the DT-100 is the full 128 Ascii character set and support for 80- or 132-col. by 24row displays. The power-up parameters for the DT-100 can be changed by the opera-tor and stored in nonvolatile memory

The DT-100 is priced at \$795, and the 9,600 bit/sec serial-to-parallel converter is

priced at \$99 and is expected to be available by Sept. 15. Tandy, 1800 One Tandy Center, Fort Worth, Texas 76102

LEE DATA CORP. Model 408

Lee Data Corp. has announced the Model 408 controller in its Series 400 controller line, said to be designed for offices requiring up to eight lines to Digital Equipment Corp. or Hewlett-Packard Co. CPUs in addition to standard IBM 3270 terminal communications.

The eight asynchronous lines feature performance levels from 1,200 to 9,600 bit/sec per line, the company said. In the 3270 mode, the Model 408 is said to support up to 16 display stations and use either binary synchro-nous or IBM's Systems Network Architecture or Synchronous Data Link Control communications standards with speeds from 1,200 to 9.600 bit/sec.

The Model 408 is said to support all Lee Data's display terminals. The 408 costs \$8,075 in single quantities and is available now, the

vendor said.

Lee Data, 7075 Flying
Cloud Drive, Minneapolis, Minn. 55344.

DELTA DATA SYSTEMS CORP. Model D2830-III

Delta Data Systems Corp. has announced the Model D2830-III Burroughs Corp.compatible terminal, featur-ing a detachable 96-key keyboard said to be capable of storing up to 300 keystrokes in nonvolatile storage

The Model 2830-III is said to offer dual host communications for selection of Burroughs' protocol or a second mainframe, the company





Now the unique combination of 4th- and 5th-generation technology that makes RAMIS® II the benchmark in mainframe productivity software is available for effective

RAMIS II/PC: A NEW DIMENSION FOR THE XT/370

RAMIS II/PC brings all the func-tions of the leading 4th-generation language to the first desktop computer specifically designed to run mainframe software.

Performance-optimized for the XT/370, RAMIS II/PC delivers complete application portability from desktop to mainframe, and can be purchased from Mathematica on its own or together with an IBM XT/370 as a complete, ready-to-run desktop information system

RAMLINK: NIGH QUALITY PC/ MAINFRAME CONNECTION

RAMLink is the most effective way to connect IBM PCs and XTs to the full power of mainframe RAMIS II. Press a single key and RAMLink will put you in touch

with RAMIS II's complete full screen environment

RAMLink downloads data from RAMIS IL IMS, VSAM or other mainframe files, and formats it for immediate use with KeepIT", 1-2-3", and other popular PC software. RAMLink also uploads data from the PC—all without expensive proto-col conversion hardware.

ITSOFTWARE: FLEXIBLE PERSONAL COMPUTING

Easy to use and flexible, ITSoft-ware[®] is a complete local system ware is a complete local system
from spreadsheet to graphics,
word processing to electronic
mail—all built around a comprehensive file manager that makes exchanging data simple. Whether you're working standalone or linked to the mainframe, ITS oftware offers the ideal solution for decision

PC product line delivers a total

TOTAL SYSTEM SOLUTION: SEE IT IN ACTION Mathematica's innovative 3-level

☐ Please send more information describing the full power of your system solution for PC users. support or local applications on your IBM PC or XT. Company Address City State Zip Telephone RAMIS'II... THE LEADER BY DESIGN CW 8/13

said. The terminals can be expanded to include local and remote printing and other personal computer applications by the addition of other Delta Data components, the company said. The Model D2830-III costs \$1.495

The Model D2830-III costs \$1,495 in single quantities, the vendor said.

Delta Data Systems, 2595 Metropolitan Drive, Trevose, Pa. 19047.

DELTA DATA SYSTEMS CORP. Delta Data 8303

Delta Data Systems Corp. has announced the Delta Data 8303 intelligent editing terminal, based on the Texas Instruments, Inc. 99000 16-bit microprocessor and aimed at the text publishing market.

The 8303 features a tilt-and-swivel monitor and a 127-key detachable keyboard that the user can operate from a desktop or lap position, the company said.

Character screen format on a 14in. screen is 28 lines by 80 char., the company said.

The 8303's text processing software is said to offer editing tasks and multitask windowing ability, with up to eight screen segments available. The 8303 also features large document control with 40K bytes of scrolling memory.

The 8303 is available with a range of options, including local disk storage with dual 5¼-in. disk drives, the company said. An RS-232 interface is used.

The 8303 is priced at \$2,395 in single quantities, the vendor said.

Delta Data Systems, 2595 Metro-

Delta Data Systems, 2595 Metro politan Drive, Trevose, Pa. 19047.

SABER TECHNOLOGY CORP.

Saber Technology Corp. has introduced a local communications link that allows users of IBM mainframes to use Saber workstations.

Saberlink is a microprocessorbased cluster controller that attaches directly to the mainframe channel. According to a company spokesman, the controller supports up to eight Saber workstations and provides interactive as well as file-transfer modes. It was designed to provide access to design analysis software resident on IBM and IBM-compatible mainframes.

The Saberlink can operate at up to 2M byte/sec. Each workstation has a 3.5M bit/sec coaxial link to the cluster controller.

The Saberlink will be available in the first quarter of the year, with prices ranging from \$29,950 for a four-port system to \$32,500 for an eight-port system.

eight-port system. Saber Technology, 2381 Bering Drive, San Jose, Calif. 95131.

PRINTERS/PLOTTERS

QUALITY MICRO SYSTEMS, INC.

Quality Micro Systems, Inc. has announced the QMS Smart Writer laser printer, based on the Motorola, Inc. 68000 microprocessor and said to offer 90,000 dot/sq in. resolution.

The product is said to simulate

Qume Corp., Diablo Systems, Inc. and Epson America, Inc. printers and features four standard fonts. It also offers 64K bytes of memory for programming features; text and graphics intermixing on one page; multiple overlays for forms storage; reverse image; two-character orientations; line and box drawing; plot/pixel mode for bit-mapping logos, signatures and other images; single command for page orientation; and absolute and relative vertical/horizontal positioning.

Centronics Data Computer Corp. parallel interface is standard; RS-232 interface is optional, the company

Intended for a work cycle of up to 3,000 page/mo, the QMS Smart Writer is said to print up to eight page/min. Letter- and legal-size, 17- to 21-lb stock can be cassette-loaded, the company said. Manual feed capability includes envelopes, postcards, transparencies and duplex copies in 16- to 34-lb stock.

The QMS Smart Writer is priced at \$4,495 and is scheduled for November delivery, the company said.

Quality Micro Systems, P.O. Box 81250, Mobile, Ala. 36689.

FUJITSU AMERICA, INC. DPMG9

Fujitsu America, Inc. has announced the DPMG9 nine-wire, dot matrix, bidirectional, 80-col. printer, said to print at 180 char./sec in draft quality.

Friction and tractor feeds are standard features, as well as automatic

perforation/skip, the company said. Other features include fine-image print pitches, a 255-char. font that is downloadable and a language selection function. The DPMG9 is said to be capable of printing international characters, superscripts, subscripts and images. The DPMG9 weighs 19 pounds and measures 12 in. by 16 in. by 4 in., the company said.

Production of the product is scheduled to begin in November, the company said. It will be distributed through Computers International, Inc. to retail stores as the Daisy-writer Matrix 9 and will be sold in two configurations: an IBM-compatible version and an Epson America, Inc. FX80-compatible version. A Centronics Data Computer Corp. interface is standard with the DPMG9, and an RS-232C interface is optional.

Both configurations will have a list price of \$695, the company said.

Fujitsu America, 3055 Orchard Drive, San Jose, Calif. 95134.

FACIT, INC.

Facit, Inc. has announced the 4528 demand document printer, reported-ly capable of printing matrix characters at 165 char./sec, or 285 char./sec at 17 char./in., with a design that allows users to tear off documents within a ½ in. of the last printed line, said to be useful for ticketing and custom label applications.

The 4528 is available in three versions: the 4528 demand document version for ticketing and labeling, the

IBM Users:

- Q. Which line printer gives you 600 lpm for data processing, 170 lpm for word processing, and generates high-resolution graphics and bar codes ... all for \$10,250?
 - ☐ IBM 5225-4 ☐ C.Itoh CI-600
- A. To begin with, IBM's 5225-4 costs about \$17,000, and that's without graphics. C. Itoh's CI-600 outperforms the 5225-4 and costs about \$6,000 less.

It's compatible with IBM 2780, 3270, 3276, 3400, 3780 and 8100. And the CI-600 replaces IBM 3284, 3286, 3287, 3288, 5225 and 5256. You owe it to yourself to have a demonstration.



C.Itoh CI-600

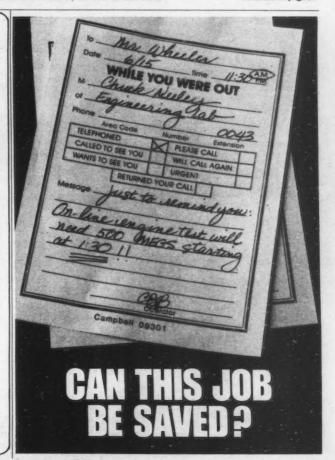
Check out the CI-600 at MTI and get more performance for less money.

MTI is an authorized distributor for C. Itoh printers and terminals, so we get them first and fast. Whether you lease or buy, you'll find MTI is the one source for all the computer and data communications expertise and service you'll ever need. And our purchase and lease prices are very attractive. Call MTI today.

New York: 516/621-6200, 212/767-0677, 518/449-5959 Outside N.Y.S.: 800/645-6530 New Jersey: 201/227-5552 Ohio: 216/464-6688



Applications Specialists & Distributors, New York, New Jeniey and Ohio. DEC, Intel, Texas Instruments, H.P., Dataproducts, Lear Siegler, Diablo Esprit, C. Itoh, Intecolor, Racal-Vadic, MICOM, Ven-Tel; Develcon, P.C. U.S. Design, Digital Eng., Cipher, MicroPro, Microsoft, Polygon & Select



Continued from page 87

4528T for standard textprinting applications and the 4528V for bar code and label printing.

RS-232 and Centronics Data Computer Corp. interfaces are standard, the company said.

The 4528 is priced at \$1,775 in single quantities, the vendor said.

Facit. 235 Main Dunstable Road, Nashua, N.Y. 03061.

VERSATEC, INC. Models 7222, 7422, 7224, 7424 plotters

Versatec, Inc., a Xerox Corp. company, has added four models to its 7000 fam-

ily of plotters.

Models 7222 and 7422 plot on 22-in.-wide media, and Models 7224 and 7424 plot on 24-in.-wide media, the company said. Models in the 7200 series plot at 200 point/in., and models in the 7400 series plot at 400 point/in., the company said.

An adjustable plot speed control permits the operator or host processor to set the speed from .125 in./sec to a rated speed of 1.5 in./sec (7200 series), enabling 24-in. models to plot up to 15 sq ft/

min, the company said.

Maximum accumulated error of a plot is ±.15%, horizontal and vertical.

The models use standard

voltages and demand less power, said to be reduced from 1,600W to 600W.

The 7000 series plotters are intended to meet meantime between failure of 4,000 power-on hours.

The Model 7222 and 7224 cost \$26,200; and the Model 7422 and 7424 cost \$35,900, the vendor said. Shipments of the plotters are scheduled for November.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

TEMPEST TECHNOLOGIES, INC.

Tempest Technologies, has announced the DWP5155 daisywheel printer, said to have an RS-232 interface and printing speed of 45 char./sec

The printer is said to accept printwheels of 10, 12, 15 pitch and over 100 font styles.

DWP5155 The costs \$5,800.

Tempest Technologies, 1776 Old Meadow Road, McLean, Va. 22102

CALIFORNIA COMPUTER PRODUCTS, INC. 5700 series

California Computer Products, Inc. has announced the 5700 series of four electrostatic plotter/printers, said to operate with media widths up to 36 in., speeds of up to 2 in./sec and resolution of up to 400 dot/in.

The series targets inte-



SPREADSHEET WITH GRAPHICS

GRAPHIC OUTLOOK combines an electronic spreadsheet with full business graphics. GRAPHIC OUTLOOK Interfaces to your DISSPLAP, SAS". DI/3000°, or MGSP graphics software. Or you can license it complete with its own graphic software. Our 30 day demonstration tape includes the full spreadsheet with graphics.

- Horizontal and vertical bar charts, pie diagrams, line and scatter
- plots.

 Drives most popular graphics terminals and plotters

 and programsheet capability lets you lin - A 3-dimensional spreadsheet capability lets you link spreadsheets
- together. Reads and writes ASCII interface files
- ling, sorting, cell labels, user-defined functions, cell edit. Special project scheduling functions
- Extensive on-line help, and tutorials
- With SPAWN command, communicates interactively with user-writ-ten programs that update worksheet values. Over 60 built-in mathematical, scientific, financial, statistical, and
- worksheet manipulation functions
- Low resolution graphics provides bar charts and line drawings on VT100-type terminals

Graphic Outlook...

Stone Mountain Computing
1096 Cambridge Dr., Santa Barbara, CA 93111

(805) 964-9101

MINI from page 81

said. Models 240/4 and 260/4 include a microprocessor with a 5M-byte removable media disk drive and a 52Mbyte fixed media disk drive,

the company said.
The 2000 series uses an Ansi X3T9.3 Small Computer Systems Interface disk bus to attach up to four disk subsystems and up to eight disk drives, for a maximum of 369M bytes of on-line Winchester disk storage with intelligent disk controllers, the company said.

Microprocessor support

The Model 240 uses a Motorola 6809E 8/16-bit microprocessor with a memory mapping unit, multichannel direct-memory access controller and time-of-day clock with battery backup.

The Model 260 is based on a Motorola 68010 microprocessor with 32-bit instructions, 24-bit address bus, 6-bit data bus, virtual memory and demand paging support, according to the company.

Up to 12 serial interfaces can be included to support host communications workstations and printers, the company said.

With a modem, the compa-ny said a 2000 series workstation and attached printer can be placed remotely from the processor. Virtual memory and demand paging have been added to the 2000's version of Unix System V, the company said.

A 2000 series Model 240/3 with one workstation, 384K bytes of memory and 20M bytes of Winchester disk storage lists for \$8,710, the company said.

A Model 260/4 with four workstations, a Motorola 68010 microprocessor, 512K bytes of error-correcting memory, a master I/O controller and 57M bytes of Winchester disk storage costs \$20,550, according to the vendor.

More information is available from Four-Phase, which is located at 10700 N. De Anza Blvd., Cupertino, Calif.

PROFESSIONALISM IS A COMMITMENT CERTIFICATION THE TEST

If you missed the CERTIFICATE
IN DATA PROCESSING (CDP)
EXAMINATION in May because
of a scheduled conflict, you
now have another opportunity
to sit for the test on Saturday,
December 8, 1984.
To patter sense the

To better serve the computer and information systems industry and practitioners, the INSTITUTE FOR CERTIFICATION OF COMPUTER PROFESSIONALS (ICCP) has expanded the CDP examination schedule to twice a year. The tests will be offered on the first Saturday in May and the second Saturday in December at lest sites throughout the world thereafter.

Application deadline for the December 1984 CDP Examination is November 2.

Allow yourself adequate time to review your knowledge in the field by sending in the coupon below today.

and the "Certificate in Data Processing Examination incuncement and Study Guide," including Application, Test Site it, Exam Content, Bibliography, and Codes of Ethics, Conduct and bod Practice.

City

State/Province/Country

Zip Code

MAIL COUPON TO:

Institute for Certification of Computer Professionals 35 East Wacker Drive • Chicago, IL 60601

CW44



- **ENHANCES OUTPUT RETRIEVAL** USING SPF/ISPF
- MENU SELECTION TO VIEW DELETE. AND REQUEUE JOBS ON JES SPOOL
- LISES SPE/ISPE BROWSE DIRECTLY AGAINST JOBS IN JES SPOOL
- 10 20 TIMES FASTER
- **RETRIEVAL THAN SPF 3.8** WORKS WITH HELD OR NON - HELD DATASETS
- ALLOWS DISPLAY OF SYSLOG
- IBM MVS OR MVS/XA WITH JES2 OR JES3
- FULLY SUPPORTED





SPECIAL PRICES IN EFFECT FREE 30 DAY TRIAL FPL \$2500. JES 2 12 MONTH LEASE \$99/MO JES 3 FPL \$5500. 12 MONTH LEASE \$199/MO

1735 S. Brookhurst (714) 991-9460 Angheim, CA 92804 Telex 181592

grated circuit board design, printedcircuit board design, geophysical mapping, mechanical design and architectural, engineering and construction applications, the company said.

Features include line enhancement, a firmware character generator and self-diagnostics, in addition to Calcomp's Enviroclean toning system, the vendor said. Users can select from 24-in. or 36-in. media widths and 200 or 400 dot/in. resolution, the company said. For darker lines, a line enhancement feature is said to provide three selections of increased line weight.

The firmware character generator is said to allow use of the 5700 series as a line printer with speeds up to 960 line/min. Built-in self-diagnostics run tests each time the plotter is turned on, and an LED and 32-char. display notify the user if attention is needed, the company said.

The 5700 series, available for shipping in September, is software-and controller-compatible with most current systems, i...cluding those from Calcomp, Versatec, Inc. and Benson, Inc., the vendor said.

In single-unit quantities, the Model 5732 with 24-in. media width and 200 dot/in. resolution costs \$24,995; the Model 5734 with 24-in. media width and 400 dot/in. resolution costs \$29,995; the Model 5742 with 36-in. media width and 200 dot/in. resolution costs \$34,995; and the Model 5744 with 36-in. media width and 400 dot/in. costs \$39,995.

Calcomp, 2411 W. La Palma Ave., Anaheim, Calif. 92801. CALIFORNIA COMPUTER PRODUCTS, INC. 1040 series

California Computer Products, Inc. (Calcomp) has unveiled the 1040 series of cut-sheet and dual-mode pen plotters, said to accommodate eight pens and width plotting capability up to Ansi Size E or International Standards Organization Size AO.

Aimed at the computer-aided design market, the 1040 series includes two plotters, Models 1042 and 1043. Model 1043 performs in cut-sheet plotting only, and Model 1042 is a dual-mode plotter that operates in both cut-sheet and roll-feed modes, the company said. With a dual-mode plotter, a user is said to be able to produce single plots and batch jobs in production environments.

Features include an eight-pen turret with automatic pen capping, an integrated communications interface, nonvolatile setup memory, automatic logon messages and self-test diagnostics, the company said. The pen turret is said to eliminate delays in throughput caused by side-to-side returns for pen exchanges, and it is said to allow up to eight colors and/ or pen types to be mixed.

Plotter compatibility with a variety of computer-aided design systems is offered, including Microsoft Corp.'s MS-DOS and Digital Research, Inc.'s CP/M-based systems, the company said. Model 1043 has a plotting speed of 6 in./sec, and Model 1043 has a plotting speed of 14 in./sec; the plotters offer RS-232, RS-449 and IEEE_488 interfaces, according to

the vendor

The Model 1043 will be available for shipping in October, and the Model 1042 will be available in November, the company said. The single-unit price for both models will be \$8,495, the vendor said.

Calcomp, 2411 W. La Palma Ave.,

Calcomp, 2411 W. La Palma Ave. Anaheim, Calif. 92801.

GRAPHICS SYSTEMS

CALMA CO.

Calma Co. has enhanced its Tegastation, an integrated computer-aided engineering workstation used to design, simulate, test and analyze integrated circuits and printed-circuit board designs.

Enhancements include two optional packages for testing digital circuit designs, networking capabilities and enhancements to the workstation's core software programs, according to Calma.

The system, based on Apollo Computer, Inc.'s Domain superminicomputer, includes an integrated set of schematic capture, simulation, test and analysis tools, according to the vendor.

Tegastation is said to perform testability analysis, fault generation, automatic test pattern generation and fault simulation.

Prices for the system begin at \$50,000.

Calma, 2901 Tasman Drive, Santa

Clara, Calif. 95050.

CALMA CO. T-Array

Calma Co. has announced T-Array, an integrated color graphics system for automatic placement and routing of single- or double-level Cmos gate arrays.

The package provides an automatic hierarchical macro placer and router, interactive macro placement and routing editors, a netlist-to-layout checker, a design rule checker and post-layout delay analysis, Calma said.

T-Array can place macros automatically, or the designer, using hierarchical boundaries established during schematic capture and simulation, can position them interactively, Calma said.

The product runs on Digital Equipment Corp.'s VAX series minicomputers and on Tektronix, Inc. 4000 graphics terminals.

T-Array costs \$120,000. Calma, 2901 Tasman Drive, Santa Clara, Calif. 95050.

DATACOPY CORP. Model 900

Datacopy Corp. has announced the Model 900 integrated imaging system, which combines the company's Model 610F Electronic Digitizing Camera (EDC) technology with its Word Image Processing System (Wips) software for use in making the IBM Personal Computer XT into an image processing workstation.

The EDC provides four scanning

The EDC provides four scanning Continued on page 90



Digital's new VT200 family.
Get innovative design, increased performance,

and a surprisingly competitive price.

Digital's new VT 220 integrates human engineering with full VT 100 performance. It features a 12" monitor and programmable function keys. The VT 240 boasts bit map graphics and text/graphics capabilities. The VT 241 adds vibrant color in a 13" screen to VT 240 features.

MTI is an Authorized Terminals Distributor for Digital Equipment Corp., so we get these fantastic terminals first. Whether you lease or buy, you'll find MTI is the one source for all the computer and data communications equipment, applications expertise and maintenance you'll ever need. And all this at hard-to-beat prices. Call MTI today.

New York: 516/621-6200, 212/767-0677, 518/449-5959 Outside N.Y.S.: 800/645-6530 New Jersey: 201/227-5552 Ohio: 216/464-6688

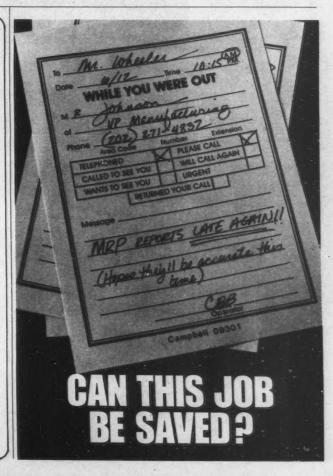


AUTHORIZED

digital

TERMINALS DISTRIBUTO

Applications Specialists & Distributors, New York, New Jersey and Ohio. DEC, Intel, Texas Instruments, H.P., Dataproducta, Lear Siegler, Diablo Espris, C. Itoh, Intecolor, Racal-Vadic, MICOM, Ven-Tel, Develcon, PCI U.S. Design, Digital Eng., Cipher, MicroPro, Microsoft, Pobygon & Select.



Continued from page 89

modes, 1,728 by 2,846 8-bit pixel resolution, programmable scan times and windows. The focus and framing capability is activited by the host computer or from an optional hand controller, the company said.

The Wips software includes applications software that can interface to most IBM Personal Computer word processing, integrated information management systems and data base management software packages.

The Model 900 package includes the Model 610F EDC and Wips software, the Model 110 image processing interface board for the IBM Personal Computer, Model 30A professional camera stand with optimized illumination, Model 40 lens set, Model 20A EDC power supply and interface cabling, the vendor said. The Model 900 integrated imaging system costs \$10,945 and will be available in October, the vendor said.

Datacopy, 1215 Terra Bella Ave., Mountain View, Calif. 94043.

DICOMED CORP.

Dicomed Corp. has announced the D38C computer graphics design system, an enhancement of the Dicomed D38+ design station said to combine the capabilities of the D38+ with a 2,000- to 4,000-line resolution 35mm recording camera.

Aimed at the computergenerated presentation graphics market, the D38C

MDS from page 81

can use Quantel's Best/Net local-area network.

A basic configuration of the System 264 includes a transaction processor, 1M byte of main memory, a real-time clock, terminal controller, communications controller and 26 I/O interface slots. The configuration costs \$105,000, the vendor said.

A 2M-byte configuration, including 800M bytes of disk storage, a 1,000 line/min printer, a ½-in. streaming tape drive for backup, 12 CRT workstations and four matrix printers, costs \$270,000, the vendor said.

MDS Quantel is located at 4142 Point Eden Way, Hayward, Calif. 94545.

MANAGEMENT
REPORTING/RETRIEVAL
CAPABILITY
FOR THE IBM S/38
For more information

nels, ross & cole, ltd. P.O. Box 4533 lk Brook, IL 60521 (312) 986-9116 combines a design workstation with a self-contained camera recording unit. The system is said to offer a range of color graphics for slide productions.

Features include 64 colors and free-form digitizing, the company said. Two type fonts, Helvetica Medium and Century Schoolbook, are included in the basic system; 20 additional fonts are optional, including a Greek Pi font for technical and medical visuals, according to the

company.

Other features include 360-degree rotation, figure-to-figure interpolation, mirror imaging, Dicomed's Image Library of computer clip art and Dicomed features like Flexigon and Flexiline figure types for automatic smooth curves, the company said.

The D38C can serve as the designer's access to Dicomed's D148 series of film recorders, which can record images at 4,000- to 8,000-line resolution in a variety of film

formats. Images created on the D38C can be transmitted to a D148 series film recorder, located either in-house or at a Dicomed service bureau, the company said.

The system can develop in a variety of formats, including slides, 8-in. by 10-in. overhead transparencies, 4-in. by 5-in. transparencies for print applications, blackand-white or color photos and cinema film, the company said.

To be available in Novem-

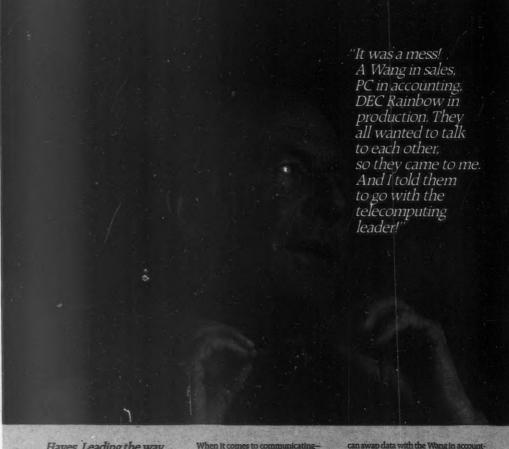
ber, the system costs \$99,950, the vendor said.

Dicomed, 9700 S. Newton Ave., Minneapolis, Minn. 55431.

TRICAD, INC. Graphics 3

Tricad, Inc. has announced the Graphics 3 computer-aided design system for the architectural, engineering and construction in-

Continued on page 92



Hayes. Leading the way with quality telecomputing systems for the personal computers that businesses use most. When it comes to communicating computer to computer—Hayes says it best. Our telecomputing systems make life easier for your managers who want to communicate via computer. And that, in itself, makes life easier for you.

Hayes Smartmodem (300, 1200 or 12006 board modem for the IBM PC and compatibles) and Smartcom II* communications software are recognized as the most dependable telecomputing system you can buy for RS-232C compatible computers.

And now Smartcom II does even more to streamline communications.

More connection capabilities. Our new Smartcom II is available for more than 16 personal computers (with more to come)! Now the HF 150 in purchasing can swap data with the Wang in accounting. While the COMPAQ* in sales gets updates from the TI in the southeastern office. Quickly and easily. Smartcom to Smartcom. And with no handholding from you.

XMODEM protocol. In addition to the Hayes Verification protocol, Smartcom II includes the XMODEM protocol, for error-free transmission to even more micros, as well as to mainframes at the information services.

Terminal emulation. Smartcom II emulates the DEC VT100 and VT52 terminals, opening the door to a vast installed base of DEC minicomputers.

Voice to data communications. With smartcom II. users can easily switch from voice to data transmission (and back again), all in the same phone call. This saves both time and money.

ENVOY from page 81

equipped with VAX-11/725 or VAX-11/730 CPUs, the company said. The vendor said the turnkey system could be modified to support other portable microcomputers or base computer systems

The applications programs are written in the C language, and the operating system is Unix-based with relational data base technology.

The Gavilan micro weighs

9 pounds and can be powered by a nickel-cadmium battery for up to eight hours of usage per charge, the company said. It features a 16-line LCD screen, an integrated function key touch pad and a standard typewriter-like keyboard. The micro also features a Cmos-based memo-ry with a capacity of up to 192K bytes, and it houses 31/2-in. floppy disk drive with 360K bytes of formatted

An internal modem offers

communication with any remote data base over normal telephone lines, and an RS-232 port is said to permit direct connect data transfer at a 9,600 bit/sec rate. An optional 5-lb printer is said to produce letter-quality printing at the rate of 50 char./ sec. A self-contained battery pack prints up to 60,000 characters between charges, the vendor said.

To load software in the field, sales representatives use the 31/2-in microfloppy

diskettes. Sales data can also be stored on the disks, and information can be forwarded from them to branch and central office CPUs. Salesmate shares a 32K-byte segment in nonvolatile Cmos memory called Magic Memory. Set aside from other processing areas, the Magic Memory is used for storing intertransaction data, workstation-control data and interdisk data, the company

Account summary files

within Magic Memory are said to maintain summaries of clients and prospects, including such information as telephone numbers, credit limits and account forecasts. Software is 85% standard and 15% tailored to company needs, an Envoy spokesman

The cost of tailoring can range from \$5,000 to \$100,000, the spokesman said. A total of 12 software packages are planned, the

company said.

A typical central office configuration includes the CPU with up to 4M bytes of main memory, from 26M bytes to 400M bytes of disk storage, two or more Digital Equipment Corp. VT240 video monitors, an on-line, letter-quality printer and com-munications options. The options include from four to eight telephone modems to one or two multiplexers, each capable of supporting eight to 16 phone lines, the company said.

A typical branch office system includes the CPU with up to 3M bytes of main memory, up to 56M bytes of disk storage, at least one DEC VT240 terminal and one letter-quality printer, the com-

pany said.

For sending information from the field, users can use public phone lines and Envoy's communications protostructured similarly to X.25 and said to feature fullduplex transmission with error checking and correction to the application level.

Purchase prices for a typical pilot program are as foilows: 20 microcomputers cost \$3,620 each; five software modules have a \$150/mo licensing fee; a VAX-11/725 with 4M bytes of main memory, a 121M-byte disk drive, a 1,600 bit/in. tape drive and two VT102s costs \$42,000; the communications package costs \$5,500; and customized system consultation services cost \$40,000, the company said.

The cost for the above system, for a three- to five-year lease, would be \$320/mo, the vendor said.

More information is available from Envoy, 1432 Main St., Waltham, Mass. 02154.



Follow the leadert If you're involved the leadert If you're in nking micros or setting stan figurations, let Hayes provinitive connection. With fe

Smartcom II liable for: IBM PC and compatibles, HP 150, DEC Rainbow 100, Texas Instru plus HP 150, DEC Rainboy

recutes up to 25 s DEC VT100 and

For additional information see you layes authorized dealer or call us di Hayes Microcomputer Products, 2022 Beachtree Industrial Blyd. ia 30092. 404/441-1617.



BM/36 NFO CENTER TODAYI AVAILABLE Call or write

IT ls on FUSION/36 Information Center. Includes integrated retrieval processor (report/queries) personal database and IBM PC Interface to S/36 files.

(415) 461-4760

ntinued from page 90

Based on a Digital Equipment Corp. VAX-11/730 CPU, Graphics 3 features 3M bytes of memory, a tape drive, a Hewlett-Packard Co. 7585 plotter and a black-and-white workstation. Software capabilities of the new system can be added to the more powerful Graphics 3 models using the VAX-11/750 or 11/780 CPUs, the company said.

All the systems are said to include the Tricad intelligent workstation

and the Ethernet protocol.

The Graphics 3 system costs \$150,000, the vendor said.

Tricad, 1655 McCarthy Blvd., Milpitas, Calif. 95035.

POWER SUPPLIES

SUPERIOR ELECTRIC CO. Stabiline

Superior Electric Co. has announced the Stabiline uninterruptible power supply/conditioners, said to provide backup power to computers and other voltage-sensitive equipment within ±3% of nominal.

When a power disruption occurs, an audible alarm is activated, and the unit is said to provide a continuous sine wave output that will not overheat transformers or overstress other components.

The product is priced at \$800 to \$1,000, depending on the model, the vendor said.

Superior Electric, 383 Middle St., Bristol, Conn. 06010.

POWER GENERAL 3075 series

Power General, a subsidiary of Unitrode Corp., has announced the 3075 series of 75W, triple-output switching power supplies, said to comply with national and international safe ty standards.

The 3075 series offers 4,000 Vac isolation, 70% efficiency and a minimum holdup time of 32 msec, the company said. Standard features are said to include output overload protection and soft start.

The 3075 series includes three models giving output combinations of 5, 12 and 24 Vdc. The +12 Vdc and +24 Vdc outputs are said to accept pulse-load currents, making them useful in applications involving disk drives, printers or other pulse-load electromechanical devices, the company said.

All models are specified for operation over a temperature range of 0 degrees Celsius to 70 degrees Celsius, the company said. The power supplies are fabricated on a single 4-in. by 61/2-in. by 2-in. printed-circuit board that weighs 1 lb.

The price for each of three models, 3075-1, 3075-2 and 3075-3, is \$119, the vendor said.

Power General, P.O. Box 189, Canton, Mass. 02021.

CLARY CORP. IIPSir

Clary Corp. has announced the UPSjr uninterruptible power system, intended for use with supermicro-

computers. The unit comes in three models: 750VA, 1.25 kVA and 2.5

The UPSjr is said to be one-third the size of standard UPS units and can reportedly operate at a noise lev-

el of 55 dba, the company said.

The price for the 750VA model is \$3,400, and the price for the 2.5-kVA

model is \$6,400, the vendor said. Clary, 320 W. Clary Ave., San Gabriel, Calif. 91776.

ONEAC CORP. FT4115

Oneac Corp. has announced the FT4115 480V-in/120V-out power conditioner for factory automation and electronic component applica-

The 1.5-kVA product operates at both 50Hz and 60Hz. At 50Hz, the product can be field-configured for 380V, 400V and 450V inputs; at 60Hz, it can be configured for 440V. 460V and 480V inputs, the company

Electrical noise as severe as IEEE 587-1980, Part A (6,000V) is reduced to under 10V normal-mode and 1/2V common-mode, the vendor said.

The FT4115 costs \$1,002 in single quantities, the vendor said.
Oneac, 2207 Lakeside Drive, Ban-

nockburn, Ill. 60015.

CALIFORNIA DC Model LR1029

California DC has announced the Model LR1029 add-on, disk drive switching power supply, said to be

rated at 5V at 3A for controller logic circuits and 12V at 1.5/2.5A for spindle-drive and head motors

Designed on a 31/2-in. by 51/2-in. circuit card, the unit has been tested on variety of full-height and halfheight floppy and hard disk drives, streaming tape units and removable-

media systems, the company said.

Total voltage variation on both outputs is ±5% including load and line regulation, centering and cross

regulation, the company said.
The LR1029 costs \$59 in single quantities; OEM quantities of 1,000 cost \$33 each, the vendor said. California DC, 2150 A

Anchor Court, Newbury Park, Calif. 91320.

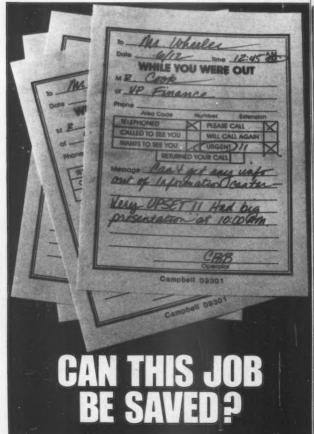
BOARD-LEVEL DEVICES

SBE, INC. MESCPU

SBE, Inc. has announced a CPU based on Motorola, Inc.'s 68000 microprocessor, that also supports Intel Corp.'s Multibus. The M68CPU board is said to access 8M bytes on its companion memory boards at 10 MHz.

The M68CPU connects to its companion M68MEM memory boards using a memory bus that is separate from the Multibus. M68MEM comes in 512K-byte and 2M-byte versions. Up to four M68MEM boards can be connected to each M68CPU.

The M68CPU board costs \$2,995. SBE, 4700 San Pablo Ave., Emeryville, Calif. 94608.





DSSD® User's Conference 9/Oct. 2-3-4, Topeko, Kons strial Grade Info

The foremost software experts of the 80s will take on the challenges of building large-scale industrial grade information systems. Some of the most sopisticated talent in the field of information

engineering—Tom DeMarco, Chester Delaney, Francis Frank, Mack Alford, Marilyn Parker; Vern Crandall, Vaughan Merlyn, Larry Martin, and Bob Lera, along with Ken Orr and J.-D. Warnier-will grapple with important issues concerning real-time systems, enterprise planning, reusable software, function models and function metrics.

Feedback '84, the 9th Annual DSSD User's Conference, sponsored by Ken Orr & Associates, Inc., will focus on the specific problems of engineering reliable, maintainable, large-scale systems that meet the needs of major organizations.



Topeka, KS; registration fee is \$500 (or \$450, if prepayment is received by Sept. 1, 1984).

FOR INFORMATION CALL TOLL FREE 800/255-2459

Registration Form

Phone

Title

Address ☐ Payment enclosed

City_ ☐ Bill Company (letter of authorization or purchase

order must accompany registration)

Hotel: Holiday Inn West Holidome, 605 Fairlawn, Topeka, KS, 913/272-8040

Ken Orr & Associates, Inc. 1725 Gage Blvd., Topeka, Ks. 66604 800/255-2459, in Kansas 913/273-0653

Vector Graphic, Inc. strength-

ens product line/96

Smart Soft-

ware, Inc. introduces forecasting

Off Site Data.

INSIDE

Communications/100

Inc. announces

microcomputer

storage pro-

gram/96

Software/96

Systems/98

package/96

MICROCOMPUTERS

Zaisan offers voice/data tool

HOUSTON - Zaisan, Inc. has unveiled the ES.3 personal workstation, which integrates an IBM Personal Computer-compati-ble micro with an executive voice/data ter-

The ES.3 is the first fully IBM-compatible personal computer system designed from the ground up to integrate sophisticated telephone functions, according to Zaisan, which raised \$10 million in a second round of venture capital financing last March and currently employs about 160 people.

The product combines an Intel Corp. 8088-based system with Zaisan's ES.1 voice/data station in a 1514- by 14-in. desktop unit, the company said, A configuration featuring a 9-in. screen, 128K bytes of random-access memory (RAM), internal 300 bit/sec modem, a single disk drive and support software costs \$2,595. This price tag is about \$250 above the cost of a similar IBM Personal Computer, according to Donald Cooper, Zaisan marketing vice-

Using two telephone lines, the ES.3 supports simultaneous voice/data communications, Cooper said. The system offers a telephone directory offering single-keystroke dialing, including authorization or logon procedures, and a phone log. A calendar management function reportedly



Zaisan, Inc.'s FS 3

permits users to maintain calendar and reminder files and to send electronic mes-sages to other ES.1 or ES.3 units. Menus alquick definition of calendar and telephone functions, Cooper said.

The system permits single-keystroke switching between three main types of functions that run concurrently and are supported by three integrated microprocessors, according to Cooper. A Motor-ola, Inc. 6805 handles telephone functions; a Zilog, Inc. Z80 supports data terminal operation and personal time management software; and the 8088 chip runs IBM-compatible software.

The ES.3 runs under Microsoft Corp.'s See TOOL page 97

GMALL TALK

Will AT&T 'pull the Unix plug?"

hile AT&T's Unix System V has taken the honors as the first operating system advertised in Sports Illustrated, it is still far from being "the standard," as claimed by

Many multiuser microcomputer hardware and software vendors are signing up with AT&T, and the first commercial products running System V are hitting the streets. But vendors remain underdably nervous that at some point in the future, AT&T will pull the plug. After all, to these vendors the system software represents a crucial bu resource that is tightly controlled by a giant supplier competing across the board in both hardware and software.

AT&T has downplayed these fears over and over again since January 1983, when it began boosting System V for public consumption. Suppliers warily cir-cling the AT&T camp, however, say that assurances are not inked into AT&T's contracts, although every other conceivable concern is addressed.

An AT&T Unix contract "looks like something from a regulatory commis-sion," according to Russell Gee, vicepresident at Access Technology, Inc. in Natick, Mass., a firm that sells Unix applications.

When one document was unveiled at -Comdex/Spring '84, independent vendors kept saying," 'This is a killer contract; it has to represent a first offer that will be negotiated down over time,' maintained.

People were either amused by it, because it weighed more than your college calculus book, or really angered by it,"

AT&T seems to be reinventing all the rules for software licensing, according to P. J. Plauger, president of Whitesmiths Ltd. in Concord, Mass., which offers a Unix-compatible operating system. 'They're really amateurs in this."

Each time AT&T changes Unix licens

ing practices, according to Jim Isaak, product marketing manager at Charles River Data Systems, Inc. in Framingham, Mass., "they roll over on various people's toes. They've never been able to avoid rolling over on [Microsoft Corp.'s]

More important, however, is that pull-

the-plug risk.
"The concern seems to be, 'Are you hooking us now with an open Unix systems policy to skin us later with a closed policy?" "AT&T Computer Systems Division Vice-President Jack Scanlon ac knowledged last month. "Our goal and commitment is to move the independent software vendors toward writing for a standard operating system — ours, System V, available on as many boxes from as many vendors as possible.

"We expect our Unix System V boxes, like everyone else's, to compete on hard-ware metrics," where AT&T's chip technology is a crucial advantage, Scanlon

3Com's data communications ware links micros to minis, mainframes

MOUNTAIN VIEW, Calif. -Corp. has announced Etherterm, an asynchronous data communications software package that reportedly connects personal computers on an Ethernet-series local-area network to mainframes and minicomput-

With Etherterm, an IBM Personal Computer reportedly can emulate an Ascii ter-minal and transfer files to and from a mainframe. The package supports nonintelligent terminals, including Digital Equipment Corp.'s VT100s and VT52s, ac-Digital cording to the vendor.

"By sharing modems, communications lines and computer ports, the overall cost of these resources can be reduced," according to Larry Hartge, 3Com's product

- 3Com marketing manager.

According to the vendor, Etherterm's interfaces reportedly include asynchronous RS-232 ports through dial-up or dedicated phone lines and interfaces to X.25 public data networks.

Etherterm uses Ethernet's Etherlink to access one of 64 ports on a Bridge Communications, Inc. gateway server, the vendor

Etherterm costs \$700 for an IBM Personal Computer server and \$1,200 for a 3Com AP server.

3Com can be reached through P.O. Box 7390, 1365 Shorebird Way, Mountain View, Calif. 94039.

Firm releases enhanced program generator for use with Dbase III

ELMWOOD PARK, N.J. -- A version of Fox & Geller, Inc.'s Quickcode program generator that works with Ashton-Tate's Dbase III, reportedly provides expanded files and the ability to do calculations on the data entry screen.

Called Quickcode III, the software is

written for IBM Personal Computers and Personal Computer XTs running under Microsoft Corp.'s MS-DOS 2.0 or later ver-

It expands the total number of data base files that may be open while users are working with Dbase III from one to eight, the vendor said.

Expanded file feature

Quickcode III's expanded file feature

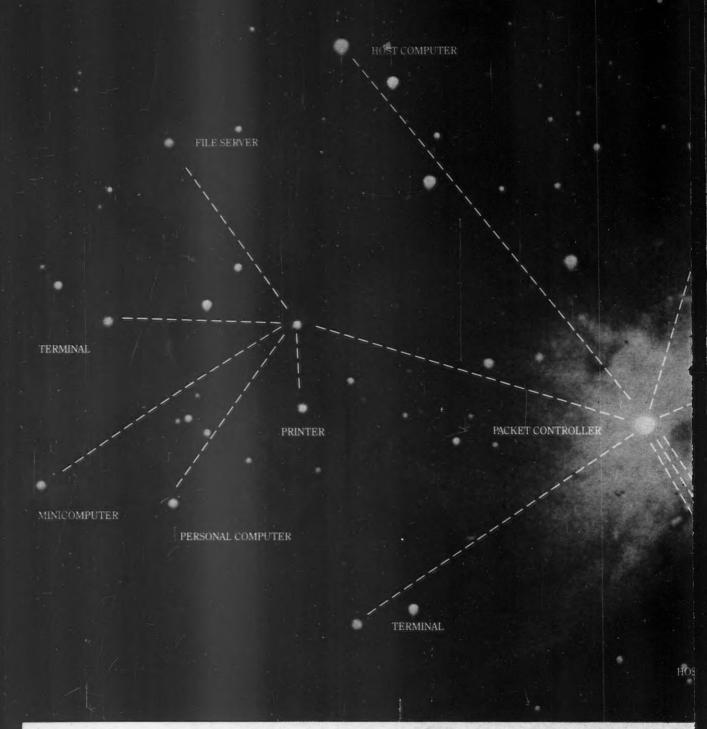
also reportedly permits files of 1,000 fields and as many as 32,000 bytes to be created for Dbase III and allows line totals, column totals and running balances to be calculated on the data entry screen

A third new feature of Quickcode III is said to be its ability to sort and select report data automatically, using a built-in report library established by the user, the vendor said.

Quickcode III is offered to current users of Quickcode at an upgrade price of \$100, the vendor said.

Dbase III users may purchase Quickcode for \$295

More information is available from Fox & Geller, which is located at 604 Market St., Elmwood Park, N.J. 07407.



INTRODUCING AT&T INFORMATION SYSTEMS NETWORK

With this network, you're bound to shine.
The new AT&T Information Systems Network
(ISN) is one of the most flexible, cost-efficient links
between data processing and office devices under the
sun. It builds your company's information network by
linking terminals, workstations, personal computers,
minicomputers and host computers, across departments, buildings or even campuses.

The network brings together a star topology, a

Packet Controller with a centralized transmission bus, and a collision-free network access protocol, making it truly unique in local networks. It not only performs with high stability in data flow conditions from low-load to near peak capacity, it also distributes access to as many as 1,900 individual users. ISN even provides centralized control and administration. And because all interfaces are housed in a central cabinet, security is high. Local and remote diagnostics make the system easy to maintain and administer.

Moreover, you're always assured of fast response time because of the shortness of the network's centralized transmission bus. A combination of low-cost copper wiring and optical fiber provides you with the

PERSONAL COMPUTER

WE'LL MAKE YOU A STAR.

COMPUTER

© 1984 AT&T Information System

flexibility and high bandwidth to handle a wide range of applications and data volumes.

ISN is based on the communications and networking expertise drawn from AT&T Bell Laboratories, and AT&T's Information Systems Laboratories for advanced research and development in new technologies. And on AT&T's stellar reputation for product reliability. What's more, this new product is backed by AT&T Information Systems' professional, highly trained sales and service teams. They're committed to making the corporate data network a reality with ISN, from design through installation.

AT&T Information Systems Network will change the way you think about local area networks. It's the ideal

system to help build your company's network today and tomorrow. And make you a star.

For more information, call your Account Executive, or 1-800-247-1212, Ext. 194.

WHEN YOU'VE GOT TO BE RIGHT.



Vector enhances micro line

THOUSAND OAKS, Calif. — Vector Graphic, Inc. has added a multiuser microcomputer, improved networking capabilities, increased mass storage and tape backup facilities to its microcomputer line.

Vector MS, which supports four users, includes a Zilog, Inc. Z80 and Intel Corp. 8086 microprocessors; 384K bytes of random-access memory (RAM), expandable to 896K bytes; Digital Research, Inc.'s Concurrent CP/M 86 operating system; three S-100 expansion slots; a serial port; two printer ports; and an RS-232 communications port, Vector said.

A two-user, 10M-byte Vector MX with one MT-50 terminal and 384K bytes of RAM is priced at \$8,580.

Linc 3.0, Vector's local-area network, has been enhanced to support 32 rather than 16 users. Vector MX, Vector SX, Vector 4-S and Vector 4 microcomputers can be tied into Linc at a cost of \$650 per computer.

Vector reportedly has increased the storage capability of its hard disk, single-user microcomputers from 10M to 28M bytes. Vector SX-4500 costs \$8,895, while Vector 4-S/50 and Vector 4/50 microcomputers sell for \$7,995.

To back up these systems, Vector has added 20M- and 45M-byte streaming tape systems, priced at \$2,505 and \$2,005 respectively.

\$2,595 and \$2,995, respectively. Vector Graphic, 500 N. Ventu Park Road, Thousand Oaks, Calif. 91320.

Smart Software releases package for business analysis, forecasting

BELMONT, Mass. — Smart Software, Inc. has introduced business forecasting software with graphics, statistical data analysis and data management capabilities.

Called Smartforecasts, the software is designed for managers, planners, analysts and market researchers. It blends statistical and judgmental forecasting methods, according to the vendor.

Smartforecasts' features reportedly include multivariate regression analysis and an array of time-series forecasting methods such as exponential smoothing and moving averages, linear and exponential trend projections and "what-if" analyses.

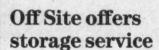
The package also provides automatic forecasting of a single data series and simultaneous forecasting of multiple data series, such as the sales of all items in a product line, according to the vendor. On-screen graphical overrides of statistical forecasts are said to be offered, as are graphical and tabular reports of forecast uncertainty.

Smartforecasts' color graphics capability reportedly is supported by such features as descriptive statistics, histograms, line graphs, scatter plots, seasonal adjustments and both auto- and cross-correlations.

The program can be used either on a stand-alone basis or to enhance a spreadsheet. Smartforeasts reportedly exchanges data files with Lotus Development Corp.'s 1-2-3 or Visicorp's Visi Calc spreadsheets. The software runs on 256K-byte models of the IBM Personal Computer and Personal Computer XT.

Smartforecasts carries a \$395 price tag.

Additional information is available from Smart Software, 392 Concord Ave., Belmont, Mass. 02178.



NORTHBROOK, Ill. — Off Site Data, Inc. has announced an off-site data storage program specifically for microcomputer users.

Diskettes or data cartridges are stored at Off Site's Chicago facility, which is fire-protected and environmentally controlled. The program includes storage, an inventory system that provides a report of every transaction, return transportation, insurance of stored data and next-day delivery of data, according to Off Site.

The system provides escrow of source code with limited access under restricted situations. If there is no activity in a 60-day period, Off Site will remind the user to back up his data files.

For \$169/year, the user can store 20 diskettes or four data cartridges. Additional space is available.

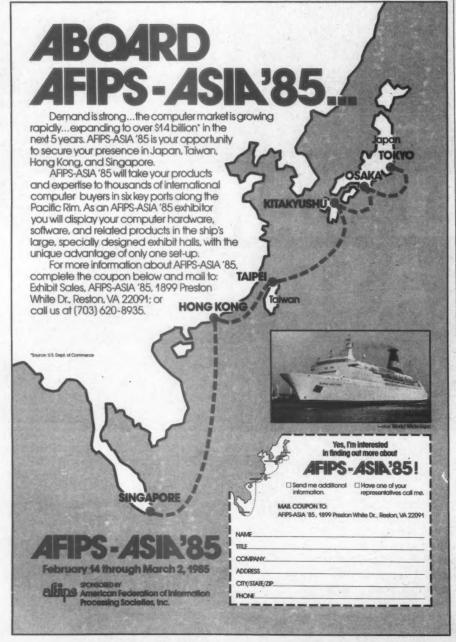
Off Site Data can be reached through P.O. Box 2067, Northbrook, Ill. 60062.

MICRO SOFTWARE

CONCEPT TECHNOLOGIES, INC. Concept 100

Concept Technologies, Inc. has introduced Concept 100, a software and hardware package said to allow integration of text and graphics in letter-quality documents.

Concept 100, for the IBM Personal Computer XT, reportedly permits integration of graphics in drafts, final manuscripts and camera-ready copy for printing. It also is said to feature word processing capabilities and the ability to accept files from Wang Laboratories, Inc. and IBM Displaywriter word processors. Its charting soft



ware is compatible with data files from the Lotus Develop-ment Corp. 1-2-3 spreadsheet, the vendor said.

The package also report-edly supports several type fonts, pan and zoom capa ty, cross-hatching and shading and color output. In addition, it can generate organizational charts, schedules and flow and block dia-

Concept 100 is priced starting at \$2,195 and includes a mouse, diskette-based software and documentation.

Concept Technologies P.O. Box 5277. Portland. Ore. 97208.

ZENOGRAPHICS, INC. Mirage; Autumn; Ego

Zenographics, Inc. has introduced three graphics software products for the IBM Personal Computer.

The firm's Mirage software reportedly produces charts, maps, diagrams and text images and accepts data from external sources such as Lotus Development Corp.'s 1-2-3 spreadsheet. It is said to include a data base query system to provide graphics generation.

The Autumn application package lets users select from more than 100 types of charts, all cataloged in a chart book, according to Zenographics. Users follow menu prompts to create charts and fill in the variable data for their application, the company said.

The Ego software reportedly allows users to insert, delete, color, scale, rotate, zoom and perform other graphics editing functions.

Mirage is priced at \$595. Autumn costs \$295, and Ego is priced at \$395, the vendor

Zenographics, Suite 250, 19752 MacArthur Blvd., Irvine, Calif. 92715.

TOOL from page 93

MS-DOS and is operationally compatible with the IBM ma-chine, Cooper said. The sys-tem design includes many Cmos chips, reducing power draw and eliminating the need for a fan (with its attendant noise), he emphasized.

The product also incorporates a speakerphone, a realtime clock and a parallel printer port, Zaisan said.

Options include an internal 1,200 bit/sec full-duplex modem, an RS-232C serial and tape cassette interface, a communications channel, expanded RAM to a total of 640K bytes, a second diskette drive and Microsoft's GW-Basic.

ES.3. a retail product, is scheduled to begin shipment next month, the company reported.

Zaisan is located at 13910 Champion Forest Houston, Texas 77069. Drive,

ZILOG, INC. Tape drive

Zilog, Inc. has introduced a nine-track streaming tape drive that reportedly utilizes firm's enhancement of the Unix kernel in its System 8000 supermicrocomputers.

Offered as an option to the System 8000, the nine-track drive handles 1/2-in., 40Mbyte capacity tapes with a density of 1,600 bit/in.

The nine-track tape drive is priced at \$12,450.

Zilog, 1315 Dell Ave., Campbell, Calif. 95008.

C. ITOH ELECTRONICS. INC. PC Itoh Utilities

C. Itoh Electronics, Inc. has announced PC Itoh Utilities, a printer utility program for the IBM Personal Computer.

The program reportedly allows users to print spreadsheet graphics in color, run software written for non-C.

Itoh printers and create custom character sets, a spokesman for the company report-

PC Itoh Utilities allows the user to print combined text and graphics on an IBM Personal Computer screen. It also provides the user

with on-line menu control of special printer functions, adjusts top-of-form positioning with variable line pitch feed and has the ability to print any Ascii file.
With the custom character

set editor, users of the PC Itoh Utilities can move, copy, replicate, invert, shift, rotate and mirror-image characters, according to the vendor spokesman.

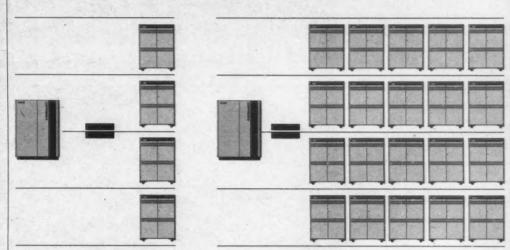
The printer utility program works with eight C. Itoh dot matrix printer mod-

PC Itoh Utilities is priced

C. Itoh Electronics, 5301 Beethoven St., Los Angeles, Calif. 90066.

See SOFTWARE page 98

LXSI VS. VAX



NOW OR LAT

Unmatched performance, deliverable now, and potential for expansion. That's ELXSI. The ELXSI System 6400 with one CPU has 4 times the performance of the VAX 11/780. Plus you can add up to 5 CPUs in the initial cabinet, and deliver 20 times VAX performance. 10 CPUs in two cabinets. Now. Or later.

The 64-bit multiprocessor System 6400 offers a choice of either EMBOS, our proprietary message-based operating system, or ENIX, our virtual memory UNIX System V operating system. You can choose either one or both. All configurations feature 32, 64, or 80-bit floating point arithmetic hardware, virtual memory, Ethernet link, the largest physical memory in the business, and more.

> The ELXSI System 6400. No one can match our performance or our potential. Not now. Not later. Contact ELXSI today for complete information.

ELXSI, 2334 Lundy Place, San Jose, California 95131 408/942-1111, Telex 172320.

UNIX is a trademark of Bell Laboratories. Ethernet is a trademark of Xerox Corporation. VAX is a trademark of Digital Equipment Corporation. EMBOS and ENIX are trademarks of ELXSI.



SOFTWARE from page 97

TMAKER CO.

Tmaker Co. has announced T/Maker integrated software, an integrated word processing, spelling checker, spreadsheet, list processor, graphics and data base program.

Since all functions operate under the word processing environment, no windowing or mode shifting is re-quired to integrate applications, Tmaker said. The word processing application reportedly features headers, footers and automatic footnote placement. Data bases may be linked to generate reports, and the spelling checker can be used with any application, according to the vendor.

The package runs on a number of microcomputers that use either Microsoft Corp.'s MS-DOS, IBM's PC-DOS or Digital Research, Inc.'s CP/M operating systems. To operate under MS-DOS or PC-DOS, 128K bytes of random-access memory (RAM) are required: microcomputers running CP/ M need 64K bytes RAM for the program

T/Maker integrated software costs

Tmaker, 2115 Landings Drive, Mountain View, Calif. 94043.

CUBICOMP CORP. Easel for CS-5

Cubicomp Corp. has introduced a version of its Easel graphics soft-ware package for its CS-5 solid-modeling design system for IBM Personal Computers and compatible systems.

The Easel software reportedly allows users to paint full-color images on their screens using a graphics tablet. Its free-stroke painting and spe cial graphics effects options can be combined with the three-dimensional solid-modeling capabilities of the CS-5, according to the vendor.

Images drawn on a digitizing tablet on a CS-5 system running Easel reportedly appear immediately on the screen. The software is said to provide over 4,000 colors simultaneous ly from a palette of 16.8 million and to allow a variety of brush strokes, from paintbrush-like to airbrush style.

Easel for the CS-5 is priced at \$2,450.

3165 Adeline St., Cubicomp, 3165 Berkeley, Calif. 94703.

FOUNTAIN HILLS SOFTWARE,

Camps C3

Fountain Hills Software, Inc. has introduced Camps C3, an expert custom-circuit costing system that runs on the IBM Personal Computer and Radio Shack's TRS-80 Model 100 microcomputer.

The system reportedly determines program costs, risk factors schedules for custom circuit design. The product is geared to managers, system designers and purchasing ersonnel who design custom circuits, Fountain Hills said.

Using natural language prompts, Camps C3 reportedly provides the user with a design checklist, cost recommendations and prototype schedule. The system uses graphics to depict various custom approaches.

The IBM Personal Computer ver sion of the program sells for \$395, while the TRS-80 Model 100 system

costs \$195.

Fountain Hills Software, 1000, 6900 E. Camelback Road, Scottsdale, Ariz. 85251.

SMALL COMPUTER CO. Filepro 16

The Small Computer Co. has introduced the Filepro 16 data base software package for Microsoft Corp. MS-DOS-based, 256K-byte microcom puters with hard disks, including the IBM Personal Computer XT.

Filepro 16 reportedly offers the ability to set up a simple electronic filing system with automatically created screens and reports. It is driven by a menu with English-language selections and has relational capabili-ties that allow data to be automatically transferred between files, Small Computer said.

Filepro 16 is priced at \$495. Small Computer, Suite 1200, 230 W. 41st St., New York, N.Y. 10036.

DIGITAL RESEARCH, INC. **AT&T Personal Computer software**

Digital Research Inc. has announced that several of its software products have been made available for the AT&T Personal Computer through AT&T Information Systems.

Among those products are DR Draw and DR Graph, which reportedly let users create and edit presentation-quality graphs and diagrams on monochrome or color monitors. Digital Research's DR Logo, its version of the Logo programming language, will also be offered, as will several other languages, including Chasic and PL/I.

The products are priced as fol-lows: DR Draw, \$295; DR Graph,

\$195; DR Logo, \$150; Chasic, \$350; and PL/I, \$750.

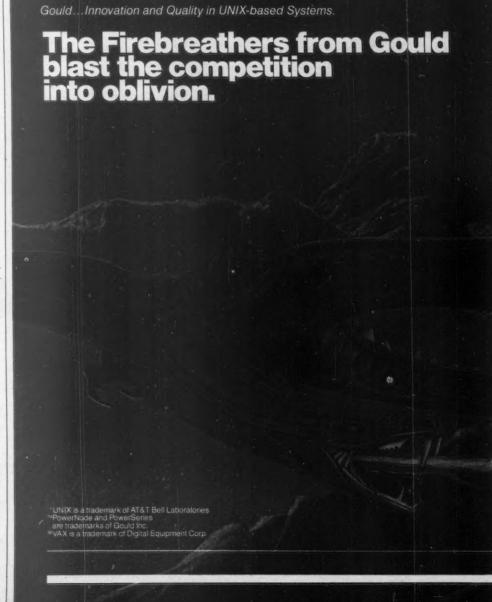
Digital Research, P.O. Box 579, Pacific Grove, Calif. 93950.

SYSTEMS

KAYPRO CORP. Kaypro 4X

Kaypro Corp. has introduced its Kaypro 4X, which reportedly offers two high-density diskette drives, each with 2.6M bytes of storage ca

Called the Kaypro 4X, the new model offers the Kaypro 4's standard bundled software, the company said. Among packages in that bundle, Mi-cropro International Corp.'s Word-star and Ashton-Tate's Dbase II are provided on one disk, eliminating the



also has a battery-operated clock and internal modem.

The Kaypro 4X is priced at \$2,495. Kaypro, 533 Stevens Ave., Solana Beach, Calif. 92075.

KAYPRO CORP. Kaypro 12X

Kaypro Corp. has introduced its Kaypro 12X microcomputer, which reportedly comes with a 10M-byte hard disk storage unit and a 2.6Mbyte high-density drive for 51/4-in. diskette

The hard disk's data reportedly can be backed up by the high-density drive on three high-density diskettes The 12X also comes with a library of bundled software said to include Micropro International Corp.'s Word-

Tate's Dbase II; and other packages The Kaypro 12X is priced at

Kaypro, 533 Stevens Ave., Solana Beach, Calif. 92075.

TANDY CORP. Dbase II for Tandy 2000

Tandy Corp. has announced that it will offer Ashton-Tate's Dbase II for the Tandy 2000 personal computer.

Dbase II is a data base manag ment system said to be useful for the generation of reports relating to accounts receivable, accounts payable, inventory, personnel, customers, payroll and mailing lists and main-

taining data on those topics.

Dhase II also reportedly can be used to sort in any desired order and

need for multiple diskettes and back-star, Mailmerge, Datastar, Calcstar, to create standard or custom format-ups, Kaypro said. The Kaypro 4X Reportstar and Infostar, Ashton-ted reports. Dbase II can be used on Tandy 2000 computers with a mini-mum of 256K bytes of memory and either a 10M-byte hard disk and one floppy disk or two 720K-byte floppy

Dbase II for the Tandy 2000 is priced at \$595.

Tandy, 1800 One Tandy Center, Fort Worth, Texas 76102.

COMPUPRO SYSTEMS, INC. System 816/G; System 816/Gg

Compupro Systems, Inc. has intro duced two new microcomputers, the Systems 816/G and 816/Gg, both based on the National Semiconductor Corp. 32-bit NS32016 microprocessor and said to be fully compatible with the IEEE 696/S-100 bus.

Both models reportedly feature

the choice of 80M, 40M or 20M bytes of hard disk storage or a 2.4M-byte, dual 8-in. floppy diskette subsystem. They also offer the National Semiconductor NS32082 memory manage ment unit and NS32081 floatingpoint unit.

The 816/G is priced as follows: \$17,495 with dual diskette drives; \$19,495 with a 20M-byte hard disk and an 8-in. diskette drive; \$19,995 with a 40M-byte hard disk unit and an 8-in. diskette drive; \$23,995 with an 80M-byte hard disk unit and an 8-in, disk drive.

The 816/Gg is priced as follows: \$12,495 with dual diskette-drives; \$14,495 with a 20M-byte hard disk unit; \$14,995 with a 40M-byte hard disk unit; and \$18,995 with an 80Mbyte hard disk unit.

Compupro Systems, 3506 Break-water Court, Hayward, Calif. 94545.

COMPUTER TECHNOLOGY INTERNATIONAL, INC. Eve II

Computer Technology International, Inc. has introduced its 14-lb Eve II portable computer, which runs software written for either Apple Computer, Inc.'s Apple-DOS or Digital Re-CP/M operating system

The Eve II reportedly comes with a 5-in. monitor, two 51/4-in. half-height disk drives and a full-size typewriter-style keyboard with numeric key pad. The unit also is said to offer three Apple-compatible expansion slots, a choice of 40- or 80-col. display and 64K bytes of memory.

Processors in use in the Eve II reportedly are the Intel Corp. 6502 and the Zilog, Inc. Z80. The Eve II's interfaces are said to include an RS-232 serial port, a Centronics Data Computer Corp. parallel printer port, a joystick port and an external monitor jack. A canvas carrying case is included

The Eve II portable costs \$1,595. Computer Technology Interna-tional, 200 Murrary Hill Pkwy., East Rutherford, N.J. 07073.

ISI INTERNATIONAL CORP.

ISI International Corp. has introduced a microcomputer designed for industrial use that is said to be com-patible with the IBM Personal Computer XT.

According to the manufacturer, the ISI 6160 uses Microsoft Corp.'s MS-DOS operating system and GW Basic and is compatible with Digital Research, Inc.'s Concurrent CP/M:

The ISI system includes one or two double-sided, double density, 54-in. floppy disk drives and optional 10M-. 20M- or 30M-byte Winchester drives

Continued on page 100

Data General

- SYSTEMS / ADD ONS
- LOCAL FIELD SERVICE
- · NATIONAL DEPOT REPAIR
- UP TO 60% OFF LIST
- ALL CABLES

BUY • SELL • LEASE



With blazing performance. runs 1.5 times faster. But with them. Give us your benchmarks all this power and speed, the and production code. We'll Great leaps in raw performance PN6000 has a dainty footprint show you numbers that are rare in the computer world. .60% less than the VAX 11/780. surpass all expectations. Call Usually, changes occur in incre-305-797-5459 for a test flight on ments of half-a-MIP or so. Now With sizzling simplicity. the Firebreathers. Mainframe real Firebreathers roar into the Even the hottest firebreather performance disquised as a arena, quadrupling the best won't fly if it's hard to run. Ours are UNIX*-based, so ease of use supermini. The scorching perthe competition has to offer formance you expect from Gould and compatibility become part With scorching speed. Gould Inc. of the power. Plus we offer the These creatures don't run a Computer Systems Division 'Compatibility Suite' little faster. Running real pro Distributed Systems Operation application software packages duction code supplied by VAX 6901 West Sunrise Boulevard Ft. Lauderdale, FL 33313 which are consistent across users, our PowerNode ™9000 our entire Gould PowerSeries benchmarks at 4.5 times taster than the VAX 11/780 ... at a comproduct line...the widest range parable price! Even our sec of UNIX-based systems in the ond-in-line PowerNode 6000 More than a myth. We know these claims sound outrageous. Make us prove

Continued from page 99 according to the vendor. It reportedly supports IBM Personal Computer-compatible monochrome and color graphics monitors and key boards.

The system features 4.77-MHz Intel Corp. 8088 chip, a socket for an Intel 8087 math coprocessor and 128K bytes of RAM (expandable to 256K bytes).

The 6160 will be available in August and can be ordered in minimum quantities of 25.

Price for the system with a single floppy drive is \$2,090. ISI International, 1275 Ham-merwood Ave., Sunnyvale, Calif. 94089.

COMMUNICATIONS

QUADRAM CORP. **Quad 3278**

Quadram Corp. has announced Quad 3278, a terminal emulation and screen capture board designed for the IBM Personal Computer.

Quad 3278 emulates an IBM 3278 terminal and allows the microcomputer to access an IBM mainframe via a 3270 series control unit,

Quadram said. Quad 3278, which includes an interface card, user manual and software, is priced at \$1,195. A 100-ft co-axial cable sells for \$95.

Quadram, 4355 Interna-tional Blvd., Norcross, Ga.

GATEWAY MICROSYSTEMS, INC. Microgate/WS

Gateway Microsystems, Inc. has introduced Microgate/WS, a communications product for IBM Personal Computers with IBM's PC-DOS 1.1 operating system.

The product provides both interactive and batch microcomputer-to-mainframe communications capabilities, Gateway said. In interactive mode, it reportedly transforms the IBM Personal Computer into an IBM 3270 series terminal. In batch mode, the product is said to mimic an IBM 2780 or 3780 terminal.

Microgate/WS's features are said to include attended command mode for direct user control; batch com-mands for unattended operation; error detection, retries and looping within command files; Ebcdic, Ascii and transparent text transmission and reception; and on-line Help

Microgate/WS, priced at \$995, includes the Gateway Serial Communication Controller and the software to drive it.

Gateway Microsystems, Suite 105, 9501 Capitol of Texas Highway N., Austin, Gateway Microsustems. Texas 78759.

TECHLAND SYSTEMS.

Bluelynx Gateway

Techland Systems, Inc. has introduced Bluelynx Gateway, which transforms an IBM Personal Computer into a 3274 controller and allows other users to communicate with an IBM mainframe.

The product reportedly will support uploading and downloading of files and 16 concurrent mainframe sions, Techland said. Bluelynx Gateway is designed for a number of local-area networks, including those from Davong Systems, Inc., Novell Data Systems, Inc. and

Xcomp, Inc. A Bluelynx Gateway configuration of four users, which includes communications boards for IBM Personal Computers, costs between \$2,000 and \$2,500.

Techland Systems, 25 Waterside Plaza, New York, N.Y. 10010.

PATHWAY DESIGN, INC. Pathway Design/BSC-RJE

Pathway Design, Inc. has announced Pathway Design/ BSC-RJE, which provides micro-to-mainframe file trans-fer in an IBM 2780 or 3780 RJE-emulated mode and communications between remote personal computers in a 3780-emulated mode.

Among package features are user exits that maintain the host session while executing local personal computer sessions and support of wild-card characters for file concatenation, according to Pathway.

The package runs on the IBM Personal Computer, Compaq Computer Corp. Compaq, Sperry Corp. Personal Computer and Wang Laboratories, Inc. Professional Computer. It works with Pathway's communications adapter board and adapter cable.

Pathway Design/BSC-RJE is available for \$595.

Pathway Design, 177 prester St., Wellesley, Worcester Mass. 02181.

INTRODUCING PINWRIT DOT MATRIX PRINT ND A HEAD TO

Our new multi-mode Pinwriter®dot matrix printers have a lot in common with our Spinwriter®letter-quality printers. Designed and manufactured with the same quality and reliability that has made our Spinwriters the best selling letter-quality printers to PC users. We also gave them many unique capabilities you won't find on other dot matrix printers. Especially at such an affordable price.

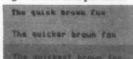
More dots, more fonts, more versatility.

One thing that makes Pinwriters stand out from other



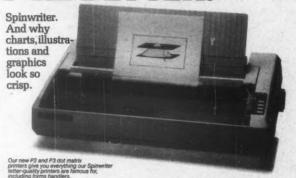
Our exclusive 18-pin print head is graphically sharpe than a 9-pin printer, as this unretouched photo shows

dot matrix printers is our printhead. It has 18 pins. Compared to the usual nine. It also has true dual-pass printing. The result: an amazing 240x240 dots per inch.



Three speeds cover all your printing needs

That's why the print is as close to letter quality as you can get without getting a



Pinwriters have something else no other dot matrix printers have. Eight operatorselectable print styles, plus as many as 11 international character sets. And an LED display to tell you which style has been selected.

What else? Three printing speeds. 300, 900 or 1800 words per minute to handle all your printing needs from word processing to data processing.

Plus, a variety of forms handlers to speed up all your paperwork. All made and designed by NEC. And all easily installed and changed by the operator.

For the final word, see your NEC dealer.

Only a demonstration can

Pinwriter and Spinwriter are registe NEC Corporation.

show you how clearly superior the Pinwriter is compared to other dot matrix printers. And how versatile it is.

For the Pinwriter retailer nearest you, call 1-800-343-4419. In Massachusetts call 617-264-8635

And find out why more and more PC users are saying, "NEC and me."



APPLIED INTELLIGENCE, INC.

Applied Intelligence, Inc. has introduced Netview, its windowing enhancement for the firm's PC/NOS network operating system that reportedly provides users access to and control of network resources.

Netview is said to be a windowbased command processor that allows users to browse the network and locate resources and specialized network applications. The software ties to resources via a connection language that allows users to connect hardware and software to specific workstations with windowing manipulation, Applied Intelligence said.

Netview's windows appear by positioning the cursor at a specific menu item, the vendor said. Other features reportedly include the ability to allow resource owners to establish access privileges for other users on the network, based on the user's group name or access level.

Netview is priced in two parts: user-mode software at \$250 and back-end software at \$650.

Applied Intelligence, 1043 Stierlin Road, Mountain View, Calif. 94043.

UNGERMANN-BASS, INC. Personal Network Interface Controller

Ungermann-Bass, Inc. has announced a network interface controller for connecting IBM Personal Computers and selected compatible microcomputers to its Net/One local-area network system.

According to a spokesman, the Personal Network Interface Controller (Personal NIC) plug-in board is compatible with other Net/One Personal Connection products and gives users the same network capabilities as the company's Personal Network Interface Unit. The product is said to be designed for use in Personal Computer workstations and to execute its protocols in the Personal Computer.

Personal NIC's high network throughput reportedly is derived from its packet-handling techniques, which utilize 12K bytes of receive buffers and 4K bytes of separate transmit buffers. The product is said to support all Net/One media and to permit use of the full range of Net/One and Personal Connection soft-

The Personal NIC is priced at \$595.

Ungermann-Bass, 2560 Mission College Blvd., Santa Clara, Calif. 95050

M/H GROUP Textcom

The M/H Group has introduced Textcom, which reportedly permits communications between IBM Personal Computers running Multimate International Corp.'s Multimate and Wang Laboratories, Inc. systems.

Textcom reportedly maintains document integrity between Multimate and Wang systems. It is said to consist of a circuit board that fits into one of the Personal Computer's expansion slots, a Personal Computer software diskette and cabling.

Documents sent by Textcom are usable immediately after being received or sent, the vendor said. Textcom's user interface is said to be menu-oriented and not to require document names to be typed when sending from the Personal Computer.

Textcom is priced at \$1,200. M/H Group, 222 W. Adams, Chicago, Ill. 60606.

CORE TECHNOLOGY CORP. Bridge

Core Technology Corp. has announced Bridge, a communications system that connects a Texas Instruments, Inc. Professional microcomputer to a Burroughs Corp. mainframe or minicomputer.

frame or minicomputer.
Bridge reportedly provides Burroughs TD830 terminal emulation and file transfer capabilities. Standard TD830 functions supported include status line, multiple pages, background printer address and reverse video, Core said. Bridge is said to feature on-line Help, multiple configuration files, user definition of the number of pages displayed and a line

monitor.

Bridge consists of Bridge I (\$495), a TD830 terminal emulation program; Bridge II mainframe Despooler (\$1,195); and Bridge II Micro Despooler (\$495).

The program requires a Professional with 128K bytes of random-access memory, a disk drive, Microsoft Corp.'s MS-DOS 2.0 operating system and a synchronous or asynchronous serial card.

Core Technology, Suite A, 1900 W. Stadium Blvd., Ann Arbor, Mich. 48103

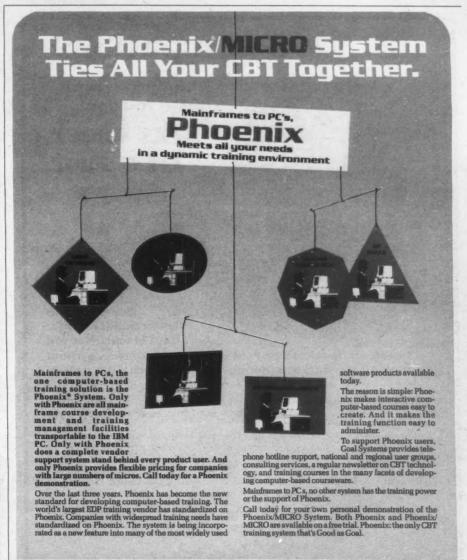
PROTOCOL COMPUTERS, INC. PCI-Link

Protocol Computers, Inc. (PCI) has announced PCI-Link, a mainframe-topersonal computer communications package.

PCI-Link reportedly supports concurrent asynchronous and synchronous sessions through the product's windowing features. The product includes Help screens, a status line, online notepad, modem support, password security, diagnostics, on-line screen management and printer control, PCI said.

Keyboard-mapping functions reportedly allow the user to replicate IBM 3278 terminal functions with a personal computer keyboard or mouse. The product also includes pop-up menus and macros of up to 4,000 characters, the vender spokesman said.

The program requires Microsoft Corp.'s MS-DOS 2.0 or IBM's PC-DOS 2.0 operating systems, a double-sided disk drive, 80-col. display, asynchronous communications adapter and Continued on page 102



The Phoenix/MICRO System is available only to licensees of the mainframe version of the PHOENIX® System.

Software Solutions Goal Systems International Inc 5455 N. High Street Columbus, OH 43214-1193 800-848-4640

Systems

ed from page 101

256K bytes of random-access memo-

PCI-Link costs \$995, according to

the vendor.

PCI, 6150 Canoga Ave., Woodland Hills, Calif. 91367.

UNIQUE AUTOMATION PRODUCTS CO. **UAP-Link for DEC Professional**

Unique Automation Products Co. has introduced a version of its UAP-Link file transfer software for the Digital Equipment Corp. Professional microcomputer executing RT-11.

Using UAP-Link, users reportedly can call any Ascii-based time-sharing facility and move text files with no special host software. Host computers with a companion UAP-Link modbinary and text files with data compression, correct formatting and automatic sessions.

UAP-Link companion modules re portedly are available for the DEC 325, 350 and Rainbow; DEC systems under RT, RSX, RSTS and VAX-11/ VMS; the IBM Personal Computer and IBM systems under VM/CMS; and systems under Unix.

The UAP-Link module for the DEC Professional is priced at \$500, the vendor said.

Unique Automation Products, Suite G. 15401 Red Hill, Tustin, Calif. 92680.

FORTUNE SYSTEMS CORP. 3270 terminal emulator software

Fortune Systems Corp. announced 3270 interactive terminal emulaule reportedly can transfer error-free tion software and hardware package

that permits Fortune Systems' 32:16 desktop computer users to access IBM mainframes or non-IBM systems that support an IBM 3276 Model 2 cluster controller unit.

Fortune's 3270 emulator allows the 32:16 to mimic an IBM 3276 Model 2 cluster control unit, an IBM 3278 Model 2 display terminal or an IBM 3278 Model 1 or 2 printer, according to the vendor. The emulation package reportedly supports up to three concurrent users while additional users perform tasks on other Fortunesupplied software.

intelligent communications controller handles all line synchronization and data transfer between the Fortune system and the IBM or IBMlike host. The 3270 terminal emulator software costs \$995. The intellicommunications board costs \$995.

Fortune Systems, 101 Twin Dol-phin Drive, Redwood City, Calif. 94065

MOLECULAR COMPUTER Cleo-3270: Cleo-3780

Molecular Computer has introduced two communications software packages, Cleo-3270 and Cleo-3780, that reportedly link its multiuser business systems to IBM mainfram

The Cleo-3270 emulates an IBM 3276/2 display controller and supports up to eight 3278 interactive display terminals or 3287 printers, Molecular said. The Cleo-3780 reportedly emulates an IBM 3780 remote batch workstation for high-speed transmission and reception of data files over telephone lines

Both packages are said to support up to 9,600 bit/sec transmission. Both are available on 8-in., singledensity or 54-in. double-sided, double-density diskettes.
The Cleo-3270 costs \$995; the

Cleo-3780 costs \$495.

Molecular Computer, 251 River Oaks Pkwy., San Jose, Calif. 95134.

TANDY CORP. T-176 SNA/SDLC

Tandy Corp. has introduced the T-176 SNA/SDLC, a protocol converter that reportedly allows the firm's TRS-80 microcomputers to communicate with IBM Systems Network Architecture/Synchronous Data Link

Control (SNA/SDLC) networks. For use on the Tandy 2000, TRS-80 Model 12 and Model 4/4P, DT-1 and DT-100, the product emulates an IBM 3276 controller and allows TRS-80 microcomputers or various terminals to emulate IBM 3278 devices, Tandy said.

The product reportedly allows users to determine the availability of the local communications link, the SDLC communications status and see all SNA information. According to Tandy, both address and control bytes of the SDLC line can be displayed, and each terminal can display its own SNA frames

When used with TRS-80 microcomputers emulating Digital Equipment Corp.'s VT100 terminal, the T-176 reportedly gives the user the capabilities of an IBM 3270 terminal. Maximum speed of the converter is 9,600 bit/sec

The communications controller is available in configurations of one to seven ports. A seven-port version sells for \$4,300.

Tandy, 1800 One Tandy Center, Fort Worth, Texas 76102.

NEW ERA TECHNOLOGIES, INC. Conexus

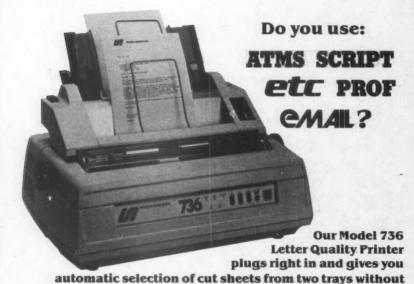
New Era Technologies, Inc. has introduced Conexus, an integrated electronic mail, computer teleconferencing and bulletin board system for the IBM Personal Computer, Personal Computer XT and compatible sys-

Conexus reportedly can be used in a local-area network or via telecommunications. It is said to offer group conferencing and keyword-accessible bulletin boards for up to 1,000 users, each with their own ID, password or one of eight different access levels.

Electronic mail is delivered automatically by Conexus at the time of sign-on and can be answered, forwarded or copied to a conference, ac-

nued on page 104

IBM 3270 Compatible!



The ISI-736 is plug compatible with the IBM 3287 for on-line printing from your IBM system. It works with all popular word processing packages.

making any software changes on your present IBM system.

Unlike the IBM 5210, it requires no expensive software changes to the system. Simply plug it in and it feeds cut sheets selectively from two hoppers under program control.

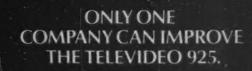
With multiple fonts and separate pitches, it will support most languages. Other features include underscoring and boldface capability.

> Call, write or TWX us today! We sell, lease and service nationally.



5855 Interface Drive, Ann Arbor, MI 48103 Telephone: (313) 769-5900, TWX: 810-223-6058 or call toll free 1-800-544-4072

Ask about the ISI-487, too, a high speed dot matrix printer that allows you to tear off output immediately, without wasting forms. Also prints large characters for labels.



it's TeleVideo. Introducing the new 925E.

Every 925 imitation on the market today lacks something only-we could give the 9251: total 927 compatibility. Since TeleVideo created the 925 stardard, no imitation has truly emulated it. At any price,

One glaince at the 925E instantly reveals our latest ergonomic thinking. A new DIN keyboard delivers the unmistakable feel of quality. A full filt and swivel non-glare CRT cuts eve strain. But its most attractive feature is a price/performance advantage. Unmatched by any competitor.

After we enhanced its appearance, we improved its performance with a buffered printer port, five additional function keys and optional graphics upgrade (Its all nearly packed in a smaller, lighter case to take up less workspace but put out more work.

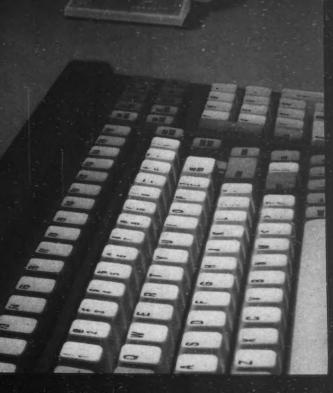
So if you want total 925 compatibility the best service, best availability and best price, don't settle for less than the original. Televideo's new 925E.

Call toll free for a TeleVideo Sales Office near you: 800-538-8725. In California, call 408-745-7760.

TeleVideo Terminals

lelevideo Systems, Inc.





Continued from page 102 cording to New Era. Mail can be sent under pen names, and users can trace the receipt status of messages and modify the message before it is re-ceived, the vendor said.

Conexus is priced at \$624. New Era Technologies, Suite 924, 2025 Eye St. N.W., Washington, D.C. 20006.

WINTERHALTER, INC. Datatalker/MAC

Winterhalter, Inc. has introduced its Datatalker/ MAC, a front-end communications processor for the Apple Computer, Inc. Macin-

The Datatalker/MAC reportedly allows the Macintosh to emulate the following IBM terminals: 3271, 3277, 3274, 3278, 3275 and 3276. The unit's controller includes an alarm, device addresses, a control unit and transmission parameters that are user modifiable, the vendor said. Also included are selectable Ascii and Ebedic transmission code, according to Winterhalter.

The Datatalker/MAC also reportedly supports all IBM 3270 function keys. Terminal characteristics include a display of 1.920 characters in 24 lines, the vendor said. IBM 3270 status indicators are said to be displayed on the

Datatalker/MAC reportedly operates at 9,600 bit/sec. It is priced at \$1,095

Winterhalter, P.O. Box 2180, 3853 Research Park Ann Arbor, 'Mich. 48106

MAY-CRAFT INFORMATION SYSTEMS, INC. Forte-Graph

May-Craft Information Systems, Inc. has announced Forte-Graph, which allows an IBM Personal Computer to access mainframe graphics packages by emulating an IBM 3279 Model S3G terminal.

By hitting a single keystroke, the user can move from microcomputer to mainsession, May-Craft said. The product works in with Mayconjunction Craft's PJ 3278/79 emulator board.

Forte-Graph costs \$1.395 and Forte PJ 3278/3279 costs \$1,195. Host-based, filetransfer capabilities can be added for \$1,000.

* May-Craft Information Systems, 4312 Beltwood Pkwy. S., Dallas, Texas

STORAGE

BERING INDUSTRIES, Sponge Model T100

Bering Industries, Inc. has announced a tape drive sub-

system for Hewlett-Packard Co.'s personal and technical computers.

The Sponge Model T100 is a 20M-byte tape drive sub-system for the HP Series 80 and 200; HP 150, 120/125, 250 and 1000; and HP 9800 series desktop computers. It is plug-compatible with the 9134X disk subsystems or an equivalent. According to the vendor, optional drivers make it compatible with IEEE-488 or HP-IB interface systems.

The Sponge reportedly provides a backup for an entire 9134X-type hard disk without the use of a computer. A 64K-byte cache memo ry, included to improve the performance of the random read and write operations, gives the ability to emulate a hard disk, according to the

The Sponge is priced at \$2,380.

Bering Industries, 1400 Fulton Place, Fremont, Calif.

TEXAS INSTRUMENTS, INC. Winchester disk drive option

Texas Instruments, has introduced an 18.2M-byte Winchester disk drive option for its Professional

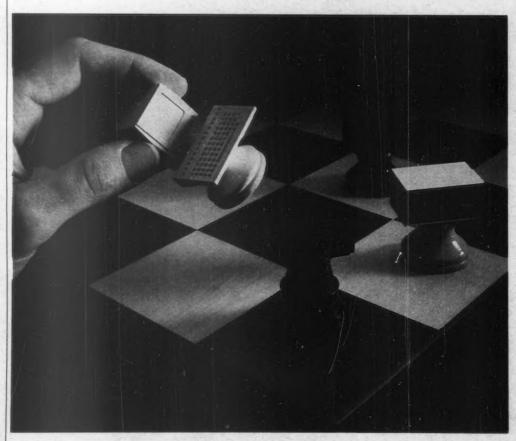
Computer. The Winchester disk drive option is said to be compatible with Microsoft Corp.'s MS-DOS 1.25 and 2.1 and to have applications in localarea networks and where large data bases are needed.

The Winchester option offers more than twice the access speed of comparable 10M-byte hard disk storage units and will fit inside the microcomputer's case, the vendor said.

The 18.2M-byte Winchester disk option is priced at \$2,995, including diagnostics software, controller board, installation manual and ca-

TI, Data Systems Group, P.O. Box 809063, Dallas, Texas 75380.

You have to think ahead a few moves to win the network game.



PRINTERS/ **PLOTTERS** PERIPHERALS

STAR MICRONICS, INC. PC Printers

Star Micronics, Inc. has introduced a line of IBM Personal Computer-compatible printers that reportedly also works with IBM Personal Computer-compatible SVS-

The PC Printers are said to printing in both 10- and 15in. versions. They provide the features of the firm's Radix-10 and Radix-15 printer line, including two print speeds, a 16K-byte buffer and print sizes of 5, 6, 8.5, 10, 12 and 17 char./in., accord-

ing to the vendor.

The devices also reportedprovide standard characters, the ability to handle many kinds of paper and a user-replaceable print head with a life expectancy of more than 100M char.

The Radix-10 PC Printer is priced at \$849. The Radix-15 PC Printer is priced at \$995, the vendor said.

Star Micronics, 200 Park Ave., New York, N.Y. 10166.

QUADRAM CORP. Quadchrome II

Quadram Corp. has introduced Quadchrome II, a color monitor for the IBM Personal Computer.

The monitor, equipped with a 14-in. tube, delivers a resolution of 640 by 240 pix-els and is designed for graphapplications, Quadram

The product reportedly can display 16 colors simul-taneously in its 25-line by 80char. format.

The Quadchrome II monitor is priced at \$650, according to the vendor.

Quadram, 4355 Interna-tional Blvd., Norcross, Ga.

AT&T INFORMATION Printer series

AT&T Information Systems has introduced six n printers: Models 470, 473,

475, 455, 457 and 458. The Model 470, 473 and 475 reportedly are 120 char./ dot matrix printers, which are equipped with various interfaces. The Model 470 (\$695) has a Centronics Data Computer Corp. par-allel interface, the Model 473 (\$695) features an IBM Personal Computer Centronics parallel interface and the Model 475 (\$745) posses an EIA RS-232C interface.

The Model 455, a 55 char./ sec, letter-quality daisy-wheel printer, offers three operator-installable face modules: Centronics parallel, IBM Centronics parallel and serial RS-232, AT&T said. Options reportedly in-clude a tractor-feed attachment, automatic sheet feeder, paper catch basket and a cover that reduces noise to db. The Model 455 costs \$1,995.

The Model 457 and 458 printers, priced at \$1,495, are 45 char./sec, letter-quality daisywheel printers with tractor-feed and automatic sheet feeder options, AT&T said.

AT&T Information Systems, One Speedwell Ave., Morristown, N.J. 07960.

INTEGREX, INC. Colourjet 132

Integrex, Inc., has intro-duced its Colourjet 132 inkjet printer, which is said to offer 36 colors and up to 252 dot/in. resolution.

The Colourjet 132 reportedly is compatible with the IBM Personal Computer, for which a screen dump disk is available. The device can print 132 columns compressed and 80 columns normal, Integrex said.

It also reportedly offers double-width, double-height and double-size printing along with underline, italics and programmable fore-ground and background col-

According to the vendor, the Colourjet 132 also prints in full videotex format from a Centronics Data Computer Corp. parallel input.
The Colourjet 132 is

priced at \$795.

Integrex, 233 N. Juniper St., Philadelphia, Pa. 19107.

EXTENDED SYSTEMS, INC. Sharespool controllers

Extended Systems, Inc has announced two shared printer controllers as part of its Sharespool family of controllers.

The ESI-2016 Sharespool reportedly uses an option slot in an IBM Personal Computer XT which allows up to Continued on page 106

F A F I

Datastream can help you develop and implement a strategy that will lead to the 3270 network your company needs. We can show you how to utilize existing equipment (even hardware that is not mainframe compatible) to give more people in your company access to your network, without compromising security. And, we can show you how your network can grow without expensive cable or leased lines.

In Good Company

As the 3270 network concept has grown, more and more com-

panies have turned to Datastream for planning and for precision products that provide a system solution. We are pleased

to have played a major role in new networks for RCA Service Company, GTE Sprint, Manufacturers Hanover Trust, and even Xerox.

We can also show you how Datastream system strategy helped a Texas data processing network expand its services to 214 new school districts while saving \$500,000. Similar success stories

have occurred at a semiconductor manufacturer, an insurance agent automation company, and a large New York bank.

If you have expansion plans for your 3270 network, let us work with you. And if network expansion is still on the "back burner." now is a good time to find out more about Datastream. Return the coupon, and we'll send you our new Application



Series. Addres City. Telephone

Datastream Communications, Inc. 2520 Mission College Blvd. Santa Clara, California 95050 (408) 986-8022 Outside California, call toll free

1 (800) 952-2500

Continued from page 105

three additional microcomputers, which would include an IBM Personal Computer XT and any two other personal computers, to share an RS-232C interfaced printer.

The ESI-2018 also uses an IBM Personal Computer XT option slot and allows three personal computers to share a Centronics Data Computer Corp.-compatible parallel printer, the vendor said

Each product reportedly features up to 64K bytes of spooler buffer memory and is transparent to the user.

The ESI-2016 and ESI-2018 Sharespool controllers are available now and cost \$595 each, according to the vendor.

Extended Systems, 6062 Morris Hill Lane, Boise, Idaho 83711.

CENTRONICS DATA COMPUTER CORP. Model 351-PC

Centronics Data Computer Corp. has unveiled a multifunctional dot matrix printer that works with IBM's Personal Computer.

The Model 351-PC features threeway forms handling of fanfold, demand document and single cutsheets, Centronics said. Model 351-PC is said to print at a speed of 200 char./sec in draft mode and 65 char./ sec in proportional, multiple-pass, near-letter-quality mode.

The printer supports pin-addressable graphics, self-test diagnostics, bidirectional, logic-seeking printing and operator selection of page length. Model 351-PC sells for \$2,195.

Centronics Data Computer, One Wall St., Hudson, N.H. 03051.

EXTENDED SYSTEMS ESI-6002 Shareplot

Extended Systems has introduced ESI-6002 Shareplot, which provides a 64K-byte print buffer for Hewlett-Packard Co. 7470A, 7475A and 7550A plotters used with the HP 150

By using one expansion slot, Shareplot reportedly allows three HP 150s to share a plotter. ESI-6002 Shareplot utilizes intelligent buffer management and job recognition algorithms to plot each successive job.

The product reportedly supports two modes of operation, single sheet and sheet feed.

ESI-6002 Shareplot costs \$485. An additional 64K-byte buffer costs \$80.

Extended Systems, P.O. Box 4973, 6062 Morris Hill Lane, Boise, Idaho 83711.

LASERGRAPHICS, INC.

Lasergraphics, Inc. has introduced its Rascol printer controller, a microprocessor-based raster color image maker for the IBM Personal Computer and other microcomputers.

The Rascol controller reportedly receives high-level graphical objects from a Lasergraphics language driver in the host computer and rasterizes them into color dots to drive the accompanying printer, leaving the personal computer free for other functions.

The controller links to personal computers via an RS-232C port or a Centronics Data Computer Corp. 8-bit parallel interface.

The Rascol is said to be compatible with the Diablo Systems, Inc. C-150 printer and Xerox Corp. 1770 color ink-jet printers.

The Rascol is priced at \$1,995. Lasergraphics, 17671 Cowan Ave., Irvine, Calif. 92714.

APPLE COMPUTER, INC. Applecolor Monitor 100

Apple Computer, Inc. has announced a 12-in. red, green and blue monitor that works with the Apple III and Apple III Plus personal computers to produce color display of both text and graphics.

The Applecolor Monitor 100 includes an 80-column text display for data processing, color display for business graphics applications and capabilities for mixing the two, the company said. The monitor includes a screen tilting mechanism and an antireflective screen surface.

Apple's Extended 80-Column Text/Applecolor Card is required to connect the monitor to the Apple IIe computer. The card supports 80-column text display and 64K bytes of internal memory, expanding the IIe's total internal memory to 128K bytes. The monitor plugs directly into the built-in color video port of either the Apple III or III Plus.

The Applecolor Monitor 100 is available for \$599. The 80-Column Text/Applecolor Card sells for \$299. Apple Computer, 20525 Mariani

MICRO PROJECTS ENGINEERING, INC. Xealibur

Ave., Cupertino, Calif. 95014.

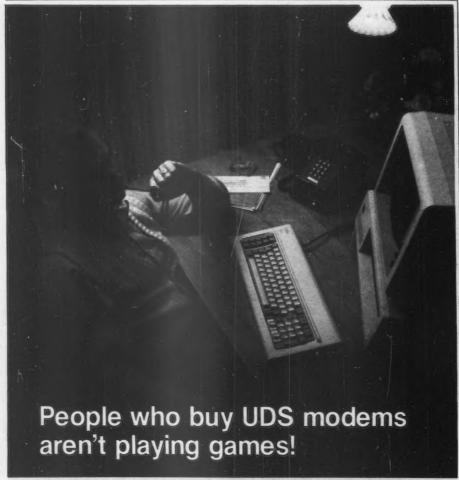
Micro Projects Engineering, Inc. has introduced a 16-bit upgrade peripheral for Tandy Corp.'s TRS-80 Models I, III and 4 and LNW Research Corp.'s LNW Model II computers.

Operating under Microsoft Corp.'s MS-DOS Version 2.11, the Xcalibur reportedly can be mounted internally or externally and is compatible with 16-bit software available for the IBM Personal Computer.

An optional monochrome video display card allows the TRS-80 to execute such programs as Lotus Development Corp.'s 1-2-3 and Multimate.

Xcalibur sells for \$495 for a 64K-byte card and includes MS-DOS and IBM Personal Computer expansion capabilities. Options include random-access memory expansion to 256K bytes, IBM Personal Computer serial RS-232 parallel printer ports, 80-character by 25-line monochrome video display card, power supply and enclosure.

Micro Projects Engineering, Suite B, 3951 Higuera St., Culver City, Calif. 90230.



You can often judge a personal computer user by the hardware he selects. If the modem comes from UDS, chances are he has a serious investment in computer and software, a serious data communications requirement and serious computer-based decisions to make.

UDS modems offer true pro-quality performance to the serious microcomputer owner. Data rates range from 0 to 9600 bps. Depending on data rate, synchronous and asynchronous models may be selected for half- or full-duplex communications. Their prices put them within easy reach of the serious user.

If data communication has pregressed beyond the game-playing stage in your microcomputer system, it's time to investigate UDS. The efficiency, reliability and potential for faster data transfer can add real professional capability. Contact Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805. Telephone 205/837-8100; TWX 810-728-2100. Inquiry hotline: 800/633-2252, ext. 354

Universal Data Systems



Created by Dayner/Hall, Inc., Winter Park, Florid

IBM's compromise: Symbolic or substantive agreement?

After more than a decade of getting its own way in antitrust challenges, IBM's re-

nomic Community (EEC) represents a symbolic surrender by the world's largest computer vendor to government regulation of economic markets

Few observers and participants in the information serindustry have placed much significance on the actual disclosure requirements by which IBM has agreed to abide. Yet, in contrast to the U.S. Justice Department's 1982 surrender in its own antitrust action against IBM, the EEC's commission did obtain from IBM a writ- IBM Chairman John R. sion did obtain from 1856 a with the Chairman content to abide by cer- Opel: No "significant tain guidelines. changes"

The Justice Department, after a decade-long dispute, simply folded its hand and declared the U.S. antitrust case was "without merit.

The EEC, on the other hand, won from IBM the pledge to unbundle main memory, cent compromise with the European Eco- disclose sufficient interface information to

allow competing companies to attach hardware and software to 370 series equipment and to release interface information in a timely manner.

The initial reaction from U.S. industry observers was that the compromise was a means of the EEC saving face by obtaining a written set of principles from IBM, but essentially not winning any substantive conces-

The most enthusiastic response from an IBM competitor was at Amdahl Corp., where spokes-man Richard Whitcob said: There was no understanding prior to this that IBM would in See EEC page 124





INDUSTRY INSIGHT

Fujitsu's strategy in U.S. explained

f the various Japanese computer companies seeking to capture a bigger share of the U.S. market, none has a larger presence than Fujitsu Ltd. The largest computer maker in Japan, with revenues roughly comparable to Digital Equipment Corp. (about \$4.4 billion in 1983), Fujitsu has a marketing arm in the U.S. in its wholly owned subsidiary, Fujitsu America, Inc.

Fujitsu America, founded in 1976, had estimated sales of about \$300 million in 1983, according to market research firm International Data Corp. Fujitsu America functions as the parent organization of three other major subsidiaries: Fujitsu Microelectronics, Inc., which markets semiconductors and microcomputers; Fujitsu Systems of America, Inc., which markets point-of-sale and financial sys tems; and American Telecom, Inc., which markets private branch exchanges and key telephone systems. Fujitsu also owns a 49% stake in Amdahl Corp.

In a recent interview, Rinzo Iwai, president of Fujitsu America, discussed the Japanese giant's operations and strategy in the U.S., as well as its relationship with Amdahl.

Fujitsu's four subsidiaries employ about 1,700 people, about 94% of whom are American, according to Iwai. A majority of top-level managers are also American, including the presidents and chief executive officers of two of the

See IWAI page 126

The research and development federal tax credit took a beating recently during testimony on Capitol Hill/110

The former head of GTE Corp. surfaced recently as the new chief executive officer of Apollo Computer, Inc./111

Gene Amdahl recently spoke a little bit about his plans to develop some type of system using Trilogy's wafer-scale integration/112

Hot on the heels of its pending acquisition of **Electronic Data** Systems Corp... **General Motors** Corp. recently announced investments in three machine vision companies/118

IBM's monopoly seen distorting market

Monopolistic power, in and of itself, distorts the rewards system that would normally spur innovation in a free market economy, according to the economist who played a key role in the U.S. government's decade-long and ultimately unsuccessful antitrust action against

Dr. Alan F. McAdams, an economist at Cornell University, was an expert witness and chief economic adviser to the U.S. Justice Department's trial team in the U.S. v. IBM antitrust suit that was dismissed at the government's behest in January 1982:

In a recent interview, McAdams said of the recently concluded European Economic Community (EEC) action against IBM: "There couldn't be a clearer demonstration of the power of IBM. The EEC has backed down. . . . It is pretty clear the EEC backed down substantially from what it initially intended."

See IBM page 123

Global-USI acquires Magnuson in bankruptcy settlement

By David Olmos

SAN JOSE, Calif. - Magnuson Computer Systems, Inc., a maker of IBM-compatible mainframes. been formally acquired by Global-Ultimac Systems, Inc. (Global-USI), a majority-owned subsidiary of Storage Technology Corp.

The acquisition comes nearly 11/2 years after Magnuson scrambled for protection from creditors under Chapter 11 of the Federal Bankruptcy Act when its once-prosperous business crumbled in the early 1980s due to competition from IBM.

Under the previously announced reorganization plan approved in California Federal District Court here, Global-USI, a Boulder, Colo., computer maker, will acquire virtually all of Magnuson's assets. In exchange, a private investor group that held most of Magnuson's \$8 million in secured debt will receive 705,680 shares of Global-USI stock, valued at less than \$6 million, according to Magnuson.

Global-USI, which is 53% owned by Storage Technology, will acquire Magnuson's inventory of IBM 4300-

'We're finding ourselves in a market niche that essentially has been abandoned by everybody except IBM and us.

- George Pilmanis, president, Global-Ultimac Systems, Inc.

series-compatible computers, design and manufacturing rights and other assets. Nearly all of Magnuson's remaining 60 employees will go to work for Global-USI. Those employees will be headquartered at Magnuson's San Jose, Calif., computer manufacturing plant, which has also been transferred to Global-USI.

The plan also requires that approximately \$2.3 million in cash be set aside to settle partially all other creditors' claims allowed by the court and administrative expenses. Magnuson's unsecured creditors have filed

claims totaling about \$20 million. Global-USI, which together with Storage Technology has been virtually Magnuson's only customer, manufactures IBM plug-compatible comsystems, minicomputer turnkey systems and applications software.

Pilmanis, president of Global-USI, said his company has been using Magnuson's IBM 4300-series-compatible processors and Storage Technology peripherals as part of its turnkey systems, which have found a place in such niche markets as manufacturing and distribution. He said the turnkey systems compose about one-third of the company's total business and "have been doing very well for us.

The other reason for [the purchase] was to acquire [Magnuson's] field engineering group and a custom-" Pilmanis said. "The field engineering group essentially allows us to double our field service group, and that opens up more cities for

marketing."
Global-USI plans to continue making the Magnuson computer, but will market it under its own name. The company also will be responsible for servicing the installed base of the Magnuson systems.

According to Pilmanis, the company acquired an inventory that ' allow us to fulfill all our marketing plans for this generation of equip

"Our major concern now is to have a next-generation CPU that will allow us to continue to be competitive, and we're working on that," he added. He said the new machine will be aimed at the IBM DOS marketplace and will probably originate through an outside source and be marketed through an OEM agreement.

"We're finding ourselves in a market niche that essentially has been abandoned by everybody except IBM and us," Pilmanis said.

As part of the agreement, Q. T. Wiles, chairman of Hambrecht & Quist, Inc., a San Francisco-based venture capital firm, will join the Global-USI board of directors.

U.S. needs Japanese approach to do business in Japan



This is the second of a two-part series

Japan's intellectual property laws have been a sore point for Americans for some time. The good news is that the old system is to be scrapped. But the bad news is that under proposed legislation, Japanese copyright (C/R) law would be placed under the Ministry of International Trade and Industry (Miti).

Miti's responsibility is the promotion of industry and not the protection of software rights. This promotional approach has drawn severe criticism from the Japanese themselves. An editorial in Japan's leading business newspaper, Nihon Keizai Shimbum, claimed that "This law makes the period of protection 15 years, far shorter than the 50 years offered under [C/R] law. Items not in the C/R law are also included — such as the right to make changes ... without the developer's permission and an arbitration system, which can

Miti's approach also allows the Japanese to close the software gap, American critics believe, given the disclosure requirements of the software registration system. Miti offi-

require licensing under certain condi-

cials were forthright in stating that this law signals a major shift in emphasis away from hardware to software.

The discriminatory barriers imposed by Japanese law have been illustrated in recent attempts by the U.S. government to "liberalize" Japan as a market. The U.S. claims that Japan denies business an "equal competitive opportunity." Government-to-government negotiations regarding the entry and participation of non-Japanese financial institutions have resulted in some gains, and the U.S. Department of Commerce is pleased with its efforts to force Miti to make the C/R laws more palatable.

U.S. officials are now saying that they will push hard for implementation of agreements now on the books, such as the NTT (Nippon Telegraph & Telephone) purchasing agreement and the agreements regarding the value-added networks, lest those agreements become paper tigers.

Business-to-government activity is also picking up. The American Electronics Association has opened its first non-U.S. office in Tokyo. That office, headed by a legal specialist in Japan-U.S. trade, will, among other efforts, monitor, review and lobby regarding Japanese laws.

Of course, the Japanese can exert pressure too. One reason for the collapse of many Japanese-American joint ventures is that the government forced companies into partnerships that, with 20-20 hindsight, simply could not work. Having a Japanes face has always been important in doing business in Japan, so the local partner must often have de facto control, if not de jure control, of the operation. Many of these failed ventures are now painfully untangling, and buy outs and dissolutions are being seen with increasing frequency.

Government can be pleasant

But if the government can be heavy-handed, it can also be quite pleasant when it suits Japanese needs. The Japanese economy is in a slump. There have even been layoffs involving management personnel. As a result, the Japanese government wants foreign companies to pick up the slack, and it has been offering deals involving loans, land and other concessions.

The problem with the legal system is that where there is protectionism, favoritism or discrimination, all enforced by law (or, seemingly, by custom), there is no recourse to the Japanese courts. Many changes will, therefore, have to be made at a policy level by trade associations, the threat of U.S. government retaliation and individual company involvement.

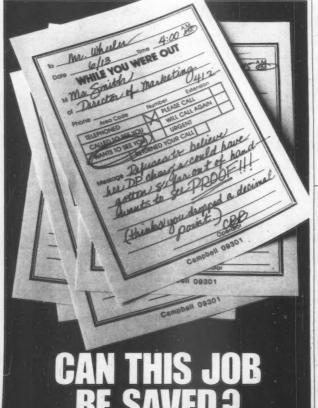
With respect to the garden-variety commercial legal matters, there is of course the availability of the courts, a vigorous bar and a well-trained judiciary. Since closing a deal in Japan

has all of the elements of a ritual that includes along the way the execution of a contract, the contract does not have the singular weight that it has in America. But most executives know that some memorialization of a transaction is always required at least as a basis for negotiation because, writes Zentaro Kitagaw, professor of law at Kyoto University, in Doing Business in Japan, "The most frequently used means (for problem resolution) is direct negotiation between the disputants themselves."

Finally, if the Japanese are feeling an economic pinch and concessions are becoming available, American companies may be better able to negotiate more favorable terms that could tie them in more closely to the fabric of commercial life: the local governments and the Industrial Councils

Doing business in Japan requires a legal strategy tailored to Japan: a commitment to long-term, extensive lobbying; excellent trade relations; access to rule-making procedures; and a local law firm to handle ordinary commercial activity, such as the institution of joint ventures and registration with the local authorities, all mixed with a dash of patience.

Saunders is a Boston-based attorney with a practice focusing on international marketing, antitrust and corporate finance.



Comdisco reports revenues down

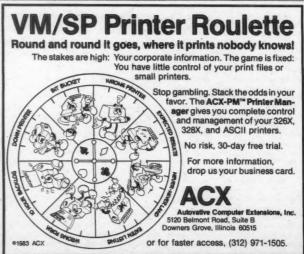
ROSEMONT, Ill. — Comdisco, Inc. recently reported third-quarter profits of \$6.9 million, or 25 cents per share, representing a 47% decline from the comparable quarter a year ago, when profits were \$13.1 million, or 45 cents per share.

Revenues for the third quarter ended June 30 were \$133.1 million, a 4.4% increase over the \$127.4 million reported a year earlier. Comdisco said the decline in earn-

Comdisco said the decline in earnings was primarily due to a decrease in the volume of tax-advantaged transactions. The Internal Revenue Service this past January initiated a review of the transactions, but completed the review in May without taking any adverse action.

In April, Comdisco reported profits of \$4.05 million, or 14 cents per share, compared with year-earlier profits of \$10.3 million, or 35 cents per share.

For the first nine months of fiscal year 1984, Comdisco's revenues were \$415.7 million, a 3.5% increase over the first nine months of fiscal 1983.



ANNOUNCING COMPUTERWORLD'S UNIX EXTRA!

On September 26, we'll turn a dynamic operating environment into an ideal advertising environment.

UNIX." Or not.

A decision nearly everyone faces sooner or later.

That's why we're devoting the September 26 Computerworld Extra! to UNIX. And why it promises to be one of the best-read Computerworld issues of the year. It's a hot market, and Computerworld is eager to bring our readers—your prospects—this special update.

We'll be delivering over 122,000 copies to Computerworld subscribers. As a special bonus to advertisers, the Computerworld UNIX Extra! will be mass-merchandised at Info-84

and UNIX Expo.

We'll ask—and answer—some fundamental questions.

- · Is UNIX appropriate outside the high-end micro environment?
- Is networking difficult?
- Is it worth the effort to learn the system?
- · Who supports it?
- · What do the look-alikes offer? And are they really compatible?
- · Major hardware vendors views of UNIX.
- · Status report on the development of UNIX standards.
- What users can get from UNIX, and what they cannot.
- · Portability of UNIX look-alikes.
- · UNIX on mainframe computers.
- Status of UNIX-based applications software for microcomputers.
- UNIX-based software for super micro systems and larger systems.

We'll talk to users and find out what they think.
We'll even provide tips for the people who've already jumped on the bandwagon.

UNIX hits home with just about everyone. So if you want to hit home with over 122,000 paid Computerworld subscribers, our Computerworld UNIX Extra! is an issue you can't afford to miss

Call the Computerworld Sales Office nearest you to reserve space for *your* advertising. Space closes August 24. Materials are due August 31.

UNIX is a trademark of AT&T Bell Laboratories.

Computerworld, 3 Framingham, MA	75 Cochituate Road	l, Box 880,
☐ Please send me ad Computerworld	lvertising information o	
Name		
Name	the same of the sa	Annual Control of the Party of
Title		
Title		
Title	State	Zip

COMPUTERWORLD

Sales Offices

BOSTON: 375 Cochituate Road, Box 880, Framingham MA 01701, (617) 879-0700 NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus NJ 07652, (201) 967-1350 CHICAGO: 2600 South River Road, Suite 304, Des Plaines IL 60018, (312) 827-4433 ATLANTA: 1853 Peeler Road, Suite D, Atlanta GA 30338, (404) 394-0758 HOUSTON: 8401 Westheimer, Suite 110, Houston TX 77063, (713) 952-1220 LOS ANGELES: 18008 Sky Park Circle, Suite 260, Irvine CA 92714, (714) 261-1230 SAN FRANCISCO: 300 Broadway, Suite 20, San Francisco CA 94133, (415) 421-7330

Subcommittee questions benefits of R&D tax credit

By Mitch Betts

WASHINGTON, D.C. — The computer industry's bid to make the 25% federal tax credit for research and development a permanent part of the tax code was dealt another setback at recent congressional hearings when several researchers questioned the credit's effectiveness.

The hearings were held Aug. 2-3 by the U.S. House Ways and Means Committee's Subcommittee on Oversight, which is gathering testimony to guide next year's deliberations on the fate of the R&D credit that is scheduled to expire on Dec. 31, 1985. A proposal to extend the R&D credit permanently was rejected by House

Ways and Means Committee members during consideration of this year's tax legislation [CW, July 9].

"Our mission is to find out whether we're wasting money," the subcommittee chairman, Rep. Charles B. Rangel (D-N.Y.), said. He repeatedly questioned witnesses about whether the tax credit has been fitted the American economy, whether it has been properly targeted to innovative high-technology research and whether the credit should exist at all for industries that conduct R&D as a regular part of their business.

Congress' General Accounting Office (GAO) reported that the tax credit will reduce federal revenues by roughly \$7 billion under current

GOT PRESSING PC PROBLEMS?

THE SOUTH

WE SERVE

law. Johnny C. Finch, the GAO spokesman, said preliminary statistics collected since the credit was enacted in 1981 provide conflicting evidence about the effectiveness of the credit, so he suggested it not be made premanent.

Edwin Mansfield, an economics professor at the University of Pennsylvania, said his studies show that the tax credit increased the R&D expenditures of 11 industries less than 2% a year. For 1983, he said, the R&D induced by the credit amounted to about \$638 million, while the tax credit reduced U.S. Treasury revenues by an estimated \$1 billion.

Consequently, Mansfield endorsed the Reagan administration's position

on the matter, which is to extend the R&D credit for three years to further study its effectiveness, rather than make the credit permanent.

make the credit permanent.

Ronald A. Pearlman, tax policy chief for the Treasury Department, also urged Congress to revise the definition of qualifying R&D expenditures to ensure that only innovative technology research is rewarded with the tax credit. He said the administration does not support permanent extension because there is inadequate data and limited experience with the credit.

Rudolph G. Penner, director of the Congressional Budget Office, told that subcommittee that the R&D credit has complicated the federal tax code and become just one of many special tax breaks afforded large corporations. "In 1981, half of all corporations had no tax liabilities," Penner said. "We have reached the point that our tax system is asked to do so much that it does nothing very well. That includes its fundamental purpose — raising revenues."

Attempting to counter the skepticism, the Electronic Industries Association (EIA) argued forcefully for a permanent extension. Testimony by EIA President Peter F. McCloskey said a permanent R&D credit would help U.S. firms compete in world trade, reduce the U.S. trade deficit and provide firms with stability for

R&D planning.
"If the credit is going to become an on-again, off-again proposition—every two or three years—the prospect of more R&D every year is diminished," he said.

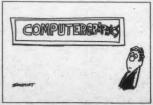
Likewise, Michael D. Rashkin, director of taxes for Apple Computer, Inc., testified in support of a permanent extension, asserting that "the greatest killer of the usefulness of a tax incentive is uncertainty."

John Young, president and chief executive officer of Hewlett-Packard Co. and spokesman for the Computer and Business Equipment Manufacturers Association, testified that a permanent R&D credit would help create new products, new jobs, more tax revenue, greater productivity and a higher standard of living.

The Lear Siegler, Inc., Instrument Division, Grand Rapids, Mich., reported that its R&D expenditures increased nearly 44% after enactment of the tax credit, and that it claimed the credit for such items as the award-winning Lear Siegler Flight Management Computer System used in Boeing Co. commercial aircraft.

Sen. Dennis DeConcini (D-Ariz.) testified that the credit is needed to help computer and electronics companies in his state that face tough foreign competition. DeConcini, who is author of a tax reform proposal that would eliminate virtually all tax credits, said the R&D credit should be extended until that major tax reform is accomplished.





Apollo looking to continue growth under new chief

By Kathleen Burton CW West Coast Bureau

CHELMSFORD, Mass. Apollo Computer, Inc., a manufacturer of

stand-alone workstations for scientists and engineers, recently announced a top management reorganization said to be aimed at meeting high-growth goals in an increasingly crowded market niche.

Thomas A. Vanderslice, who resigned in December as president and chief execu-tive officer of GTE Corp., will replace Apollo founder J. William Poduska Sr. as chief executive officer and Charles P. Spector as company president.



Poduska will continue in his role as chairman of the board, focusing on long-range planning. Spector will assume new duties as vice-chairman of

the board and will continue to run operations on a day-to-day basis. Vanderslice 'was responsible for GTE's domes tic and international telephone, communications and electrical products opera-tions; during his tenure, GTE's sales grew to over \$12 billion

Apollo, founded in 1980, manufactures Unix-based workstations. Since 1981, when the company lost \$2.9 million on sales of \$3.4 million. Apollo has forged a stunning busi-

ness success. Second-quarter revenues were over \$46 million, a 250% increase over the same period in 1983. Apollo's profits last year were

\$13 million, while revenues for that same period climbed to \$80.7 million .

"With the addition of [Vanderslice]," Poduska said, "we are putting the infrastructure in place for our next phase of growth." Po-duska said Apollo is aiming to exceed \$1 billion in sales by 1986.

Neil H. Kleinman, general manager of International Data Corp.'s Pacific Technology Center, said "Apollo Technology Center, said "Apollo seems to recognize that to become a

major player in the computer industry, they have to be a full service computer corporation. New competitors are forcing them to up the ante

and position themselves to expand their product line into wider areas that will logically include both high- and low-performance processors. They are one of today's premier companies, and I would place them in the same fast-growth category that [Intel Corp.] once was.

Fred Cohen, an analyst at L.F. Rothschild, Unterberg Towbin in New York, said Poduska is easing out of Apollo's everyday operations to devote more time to his personal life.

OXFORD Fall Seminar Se

An important session for those con cerned with optimizing CICS and IMS systems. Topics include resource management, ADS options with UFO* and UFO/COBOL," and the new spreadsheet and PC to mainframe data link capabilities of MAXICALC" II and pcMAINFRAME." For reservations call (800) 631-1615 or fill out and send in

nonneast	
September	12-Pittsburgh, PA
	25-Cherry Hill, NJ
October	3—Syracuse, NY
	4—Hartford, CT
	9-New York, NY
	11-Saddle Brook, NJ

	4—Hartford, CT 9—New York, NY 11—Saddle Brook, NJ 16—Boston, MA
South	
August	16-Atlanta, GA

September	13—Miami, FL 19—Baltimore, MD
	20—Washington, DC
October	4-Nashville, TN

	11-Des Moines, IA
	18-Chicago, IL
	25-Detroit, MI
October	11-St. Louis, MS
	16-Minneapolis, MN
	25-Omaha, NE
	30-Columbus, OH
November	15-Milwaukee, WI

September 25-Newport Beach, CA

	26-Los Angeles, CA
October	2-Houston, TX
	16-Dallas, TX
	23-Phoenix, AZ
November	6-Denver, CO
	13-Portland, OR
	21_Concord CA

Canada

September	19-Montreal, PQ
October	4—Toronto, ON

Seminar City	Date
Name	
Title	
Company	
Address	
City	Ctate/Dray

OXPORD SOFTWARE CORPORATION 174 Boulevard, Hasbrouck Heights, N.J. 07604

How to tell if you really need an on-line application development system.

To reduce backlogs without adding specialized Command Level COBOL resources...more and more DP managers are installing on-line application development systems. Do you need one? And if so, which one(s) do you need? You'll learn the answers by using our grid

The Resource Management Grid. It defines your unique needs.

Oxford Software developed the grid based on our experience with more than 2,000 CICS users. In matrix form, it expresses the two basic criteria that affect the management of every on-line application project... Delivery Time Concerns and Performance Concerns. Both factors are vital to consider...because without exception, every approach to on-line application development asks you to compromise somewhat

How to use the grid.

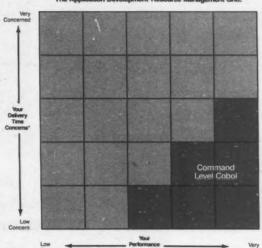
Using our free kit, define and then plot on the grid your realistic concerns about every on-line application project on your work list. The composite plot will graphi-cally define your application development system needs and your overall management challenge

How to tell if you need an application development system.

If many of your plot points cluster outside of the Command Level COBOL "strength area" (shown in orange), you'll benefit tremendously by using an on-line application development system. And, by analyzing the patterns of your plot points, you can tell which on-line appli cation development system(s) will meet

Call or write for your Grid Kit.

Our Grid Kit will help you define your own unique parameters...and with over-lays it will show you where each of our on-line application development systems perform best. It illustrates and compares two distinct approaches to on-line applications development



Number of applications, Skills available, Due date lity, Application complexity, Transaction volume A Function of—Number of programmers,
 A Function of—Machine resource availab

1. UFO...the fourth generation

More than 1,700 UFO users can tell you it's the fastest way to develop and maintain on-line applications.

2. UFO/COBOL...the COBOL

Now all your programmers who write in ANSI/COBOL can develop on-line applications. It's fast, easy to learn, and its machine productivity is truly

One (or both) of these systems could be the best answer to your application development needs. Call or write for details

Call OXFORD today (800) 631-1615

-	OXFORD SOFTWARE CORPORATION 174 BOULEVARD / HASBROUCK HEIGHTS, NJ 074004/201 288 4915
-	☐ Please send me your Grid Kit. ☐ I'd like to schedule a ☐ UFO and/or ☐ UFO/COBOL demo. Please call to set a date.
	Name
	Title
	Company
	Address
	City
	State/ProvZip/Code
	Phone () CW-1

Trilogy announces involvement in production of small processor

By Jeffry Beeler CW West Coast Bureau

CARMEL, Calif. - Having already shelved plans to de-velop a large IBM-compatible mainframe, Trilogy Systems Corp. now intends to involve itself in producing a comparatively small processor in-stead, according to the company's founder, Gene Amdahl.

But exactly how the small machine will compare to existing computers in process-ing power remains a mys-

Amdahl himself, however, discussed the machine's processing horsepower only obliquely. "I don't know yet exactly what level of performance the product will pro-vide," he said recently during a symposium sponsored by California's San Jose State University and the Institute for Information Man-

A Trilogy insider, who requested anonymity, expects the proposed processor to incorporate Cmos technology and to be rated at about 10 million instructions per second (Mips).

Also shrouded in uncertainty is the question of whether Trilogy will bear the brunt of developing the small computer itself, or whether most of the work will be shouldered by one or more of its major business partners.

When Amdahl spoke of wanting to develop a small computer, "he [Amdahl] may not have been referring to Trilogy per se," according to Dr. Leilani Allen, the Institute's assistant general man-

Amdahl's reference Trilogy's interest in producing a small computer came during a July 26 session of a four-day symposium ad-dressing the topic of "Information Economics for CEO."

The company's proposed small computer will reportedly incorporate the same "wafer-scale technology" that Amdahl had originally intended to use in his aborted high-speed mainframe.

current business plan calls for us to use that technology as best we can by adapting it to a smaller com-

puter," Amdahl said.
' Founded in 1980, Trilogy had originally planned to de velop a fault-tolerant main-frame that would run IBM large systems software but would provide considerably more processing power than Big Blue's 3081. Estimates of the Trilogy machine's execu-tion rate put it in the 32 Mips performance class

But a long series of unforeseen technical and manage ment hitches prevented the proposed mainframe from ever leaving the drawing board. Contrary to wide-

spread opinion, the failure of Trilogy's development effort resulted not from one monolithic technical snag, but from a number of smaller problems that together proved fatal, Amdahl said privately following his symnosium address. In fact. Amdahl characterized Trilogy's past product woes as "90% a

of

management

problem

rather than technology."

Whatever the source of its troubles, Trilogy eventually found itself unable to complete its mainframe development effort because it lacked sufficient research and development funds to make some fundamental but necessary design changes. So in June, Amdahl reluctantly announced his decision to scrap

the company's plans to produce and sell a large-scale

At the same time, however, he also reaffirmed his intention to forge ahead with development of the corporation's wafer-scale technology and license it to other vendors for possible inclusion in their future mainframes.

Wafer-scale technology re-

fers to a species of semiconductor logic in which chips are so large that each one occupies an entire silicon wafer. One of the purported advantages of Trilogy's technology over conventional logic circuitry is that it minimizes the number of interchip connections and thus greatly improves processing



IBM 3270 PC/G

If one picture is worth a thousand words, your Smart Desk can tell you volumes Especially when it's equipped with a new

IBM 3270 Personal Computer/G or GX.

These 3270 PCs let you create charts, graphs, 3-D technical diagrams and other high-resolution graphics right in the office. Or you can view engineering designs created on other IBM graphics systems.

The graphics are created by downloading data from your company's mainframe computer or by running stand-alone. So, in either case, the host is free to go its way while you go yours. The results: faster response time and more

cost-effective performance. The 3270 PC/G's 14-inch screen displays up to 8 colors with 76 PELs per inch; the 3270 PC/GX's 19-inch screen, up to 16 colors with 93 PELs per inch.

An optional "mouse" makes for fast, easy creation of graphics. An optional writing tablet lets your sketches appear right on the screen. There are even panning and scaling

features for enlarging important details.

And, because both of these new computers are IBM 3270 PCs, you get a lot more than just pretty pictures.

FAA to test IBM, Sperry air traffic control computer systems

WASHINGTON, D.C. —
The Department of Transportation recently announced that two competing computer systems designed to handle increased air-traffic volume in the next decade will be tested at the Federal Aviation Administration (FAA) Technical Center near Atlantic City, N. I.

tic City, N.J.
IBM and Sperry Corp.

have delivered their computer systems to the center, the department said. After tests during the next six months, one of the systems will be chosen to replace the computers in the nation's 20 air traffic control centers.

Since last September, IBM and Sperry have been competing under separate FAA contracts to design a system that can run the same software used by the existing IBM 9020 computers, in use since the early 1970s.

According to the FAA, the new system must have the capacity and processing power to handle the traffic increases projected for aviation over the next decade. In fiscal year 1983, the 20 control centers handled more

than 29 million operations, and that total is expected to grow to more than 42 million by fiscal year 1995.

After IBM and Sperry have completed checks of their systems, they will begin a series of tests to demonstrate the capabilities of the two systems to FAA officials. These tests are expected to run until January 1985. In

October, the FAA plans to solicit bids for the system, enabling IBM and Sperry to submit proposals that include their test results.

The winning system will be selected in June 1985, with deliveries expected to begin in April 1986, the FAA

In a related effort, the FAA also said it will award competitive contracts for the design of the Advanced Automation System later this summer. That system includes new controller workstations (called sector suites), processors and software programs to increase automation in air-traffic control.

Comserv, CDC reach agreement

MINNEAPOLIS — Control Data Corp. and Comserv Corp. have reached an agreement in principal under which CDC will acquire a 20% interest in faltering Comserv, with an option to acquire an additional 20% share over the next five years.

The agreement came late last month as Comserv was on the brink of defaulting on interest payment of \$1.1 million on outstanding subordinate convertible debentures. The grace period on the loan was due to expire July 31. CDC loaned Comserv \$2 million and, in exchange, received the right to buy 800,000 shares of new convertible preferred Comserv stock at a price of \$3.5 million. The agreement is subject to approval by Comserv stockholders. A Comserv spokeswoman said the investors are expected to approve the transaction.

CDC also was granted an option to purchase another 20% of Comserv within four years, commencing one year after a definitive agreement has been reached. A CDC spokesman would not comment on whether the firm expects to pursue the option.

Comserv has been plagued by financial difficulties since 1982, when profits slipped to \$1.6 million. The company reported an \$11 million loss in 1983 and anticipates a \$3 million loss in 1984, the spokeswoman said.

CDC has been interested in Comserv's manufacturing resource planning software to round out its computer-integrated manufacturing line of products, the CDC spokesman said. "This fits well into our plans," he said.



IBM 3270 PC/GX

Each system can display up to four different host sessions concurrently, and run a wide range of IBM Personal Computer applications. You also get two electronic notepads on screen for keeping track of important information.

Put yourself behind a Smart Desk equipped with an IBM 3270 PC/G or GX, and draw your own conclusions. We think you'll like our simpler approach to sophisticated graphics.

To receive literature, call

1 800 IBM-2468, Ext. 90, or send in this coupon.



PC/G and GX Please have a	e more information on th	
Name		KOPPENSON MATERIAL
Company		
Title	Phone	
Address		
City	State	Zip.
The Sr	nart Desk	from IBM

CDC buys Visi On rights

MINNEAPOLIS — Control Data Corp. recently purchased for an undisclosed sum the technical rights to Visicorp's Visi On system. CDC, in turn, will lease the retail marketing rights of Visi On to Visicorp.

CDC spokesman Alan Caminiti said the company's immediate plan for Visi On is to integrate the system into

CDC's remote processing ser-

The system and its applications packages will be marketed initially to large-account customers through CDC's Business Information Services business unit.

The Visi On development team will join CDC's Campbell, Calif.-based development group.

AT&T reveals joint chip venture in Spain

MADRID — AT&T said late-last month that it had reached an agreement here with the Compania Telefonica Nacional de Espana (CTNE) to form a joint-venture company that will manufacture integrated circuits at a \$200 million plant in Spain

The joint venture company will be 80% owned by

AT&T and 20% owned by CTNE, Spain's national telephone company. The plant will have the capability to design and manufacture Cmos products.

The facility will serve Spain's custom integratedcircuit market and will provide access to markets in Europe and other international markets. Construction is scheduled to begin in 1985, with production starting in 1987, a spokeswoman said.

The project is expected to create about 700 jobs for Spanish citizens, who will be trained at sites in the U.S. and Spain.

The Spanish government has awarded a grant that will go to pay for a large part of the cost of the plant.

SCIENCE/SCOPE

Paper-thin gallium arsenide solar cells have been fabricated using methods identical to those used for making conventional gallium arsenide cells. The new cells would reduce the weight of a spacecraft and hence the cost to launch it. The new thin cells exhibit an efficiency of greater than 16%. A typical cell is approximately 70 micrometers thick and weighs 0.2 gram. The demonstration proves that Hughes Aircraft Company research scientists can tránsfer experience, techniques, and processing steps for making conventional cells to the thin cells.

Hybrid integrated optical receivers have been developed by Hughes research scientists for transmitting microwave-modulated optical signals over fiber-optic links. The receivers are part of an effort to find inexpensive links for such applications as phased-array antennas, satellite ground stations, radars, and communications systems. Each receiver consists of a high-speed gallium arsenide Schottky photodiode developed at Hughes and a low-noise amplifier using commercial gallium arsenide field-effect transistors. These receivers are designed to operate at a modulation frequency of 3 GHz with a 1 GHz bandwidth. Their advantages over discrete components include better sensitivity, lower noise, and the elimination of ripples in the frequency response caused by impedance mismatch between detectors and commercial amplifiers.

A family of redundant control units for satellite communication uplink amplifiers has been introduced by Hughes. The new control units, designated the 9300HA series, are designed to provide fully automatic monitoring and switching for redundant operation of two or more high-power amplifiers (HPA). The units consist of one rack-mountable drawer containing an RF-switched, high-power load. They can be operated at C-, X-, or Ku-band, and are compatible with the complete line of Hughes HPAs.

In the last 20 years, over \$611 million in savings have been negotiated by Hughes and the Department of Defense as a result of engineering proposals for cutting costs of military systems. Since the inception of the Value Engineering program, Hughes has had 675 proposals accepted in 50 programs. The changes stemmed from advanced technology that was not available at the time the original contracts were signed. They resulted in substantial improvements in quality, reliability, producibility, and life-cycle costs. Savings amounted to 3% of Hughes sales during the period, with the U.S. government's share amounting to nearly \$500 million. The Value Engineering program is designed to encourage employees to look at the functions of a product and develop alternatives that cost less, perform better, and improve reliability.

Hughes Missile Systems Group, located in Canoga Park, California, an attractive suburb of Los Angeles, is seeking engineers and scientists for such developmental and engineering programs as AMRAAM, multimode guidance, Phoenix, and IR Maverick. Openings are in radar and electro-optical systems design, systems software and hardware/software integration, analog and digital circuits design, hybrid process engineering, systems performance, and microwave and power supply/transmitter design. Qualified applicants are assured prompt replies. Please send resume to Hughes Engineering Employment Manager, Dept. S3, Fallbrook at Roscoe, Canoga Park, CA 91304. Equal opportunity employer. U.S. citizenship required.

For more information write to: P.O. Box 11205, Marina del Rey, CA 90295

HUGHES

National Semi, DLA end dispute

WASHINGTON, D.C. —
The U.S. Defense Logistics
Agency (DLA) last week said
it has reached a final settlement with National Semiconductor Corp. in a case involving the company's failure to
test adequately silicon chips
supplied to the U.S. government from 1978 to 1981.

In a settlement announced August 7, the DLA said it would drop its previously an-nounced debarment proceedings against National Semi, an action that would have banned the company from contracting with any agency of the federal government. A major reason for the governdebarment ment's debarment action stemmed from National Se-mi's refusal to identify the corporate officers and employees responsible for the fraud. That issue was resolved, National Semi said in a statement, when the com-pany "agreed on a procedure by which employees could voluntarily describe their own responsibility to DLA under a court order assuring confidentiality."

A DLA spokesman said National Semi also agreed to four steps to prevent recurrences in chip testing fraud. These included the creation of an internal audit group to monitor the Military-Aerospace Products Group and the reassignment of several managers within that group, creation of a company policy requiring the dismissal of employees who fail to comply with government rules and installation of a confidential hot line for employees to report company fraud or abuse.

The company also will pay \$373,200 to cover expenses incurred by the government as a result of the case.

As reported, National Semi pleaded guilty in March to a 40-count federal indictment that it inadequately tested chips sold to the government. The company paid \$1.75 million in fines and penalties at that time [CW, March 12].

At last, a system with a head for numbers, an eye for pictures, and a mind of its own.

Introducing the Kodak KAR-4000 information

system. Take the processing power of a stand-alone computer. Add a "photographic memory" to access original document images. Top it off with comprehensive, one-source software and service.

The result: a Kodak KAR-4000 information system.

It outperforms any other computer-assisted retrieval system. But it also functions independently to process both documents and office data.

> You gain independent computerntrolled access to on-line data and documents. Without the

staggering expense of on-line computer

storage.

You even gain independence from service—all components in the KAR-4000 system are serviced by Kodak.

So before you pick any other "system," send in the coupon. And pick the brains behind the KAR-4000 information system.

Send to: Eastman Kodak Company, Business Systems Markets Division, Dept. DP4578, Rochester, NY 14650

Please tell me more about Kodak's KAR-4000 information system.

Company

Address

City State

Please answer the following:

1. How many incoming documents per day do you process? ☐ 1000-2000 ☐ 2000-5000 ☐ Over 5000

2. How many documents do you normally retrieve each day? ☐ Less than 10 ☐ 10-25 ☐ Over 25

The Kodak KAR-4000 information system. It gives the computer a photographic memory.



Eagle co-founder resigns to head own firm

By Kathleen Burton

LOS GATOS, Calif. — Charles Kappenman, co-founder of financially troubled microcomputer manufacturer Eagle Computer, Inc., recently resigned his position as chairman of Eagle to devote his full-time efforts to his new company, Audio Visual Laboratories in New Jersey.

Ronald N. Mickwee, Eagle's president and chief executive officer, will replace Kappenman as chairman, and Gerard Kappenman, another Eagle founder and former company officer, will replace his brother Charles on

Eagle has been battling financial setbacks for several months. In June,

the firm was unable to meet a scheduled repayment plan to several major suppliers. Frank Weikel, Eagle's director of corporate communications, said recently that Eagle's credit communicate has approved a plan to restructure the company's \$9 n.dllion unsecured debt, and the company's creditors are presently reviewing the proposed plan.

Mickwee said the company has also appointed Sam Goodman as its executive vice-president and chief financial officer.

Goodman is the first executive hired since the resignations in June of six vice-presidents and three directors.

ctors. Mickwee said that Goodman, formerly the president and chief executive officer of Nutritional Foods, Inc. of San Francisco, has "a reputation for helping companies achieve profitability" and that his appointment will free Mickwee to redirect Eagle's long-range marketing strategy.

Goodman was quoted in a company press release as saying he was "intrigued by the prospect of trying to save Eagle, although it may take a year to accomplish a change in direction and a return to profitability."

Goodman was chief financial officer at Ampex Corp. during its turnaround in 1974, and, following that assignment, he helped revitalize a \$300 million division of the W.R. Grace Corp.

Mad registers monopoly suit against Apple

By Kathleen Burton

SANTA CLARA, Calif. — Mad Computer, Inc., a personal computer manufacturer based here, recently filed a federal court suit alleging that Apple Computer, Inc. conspired to monopolize the microcomputer market, stifle competition and thwart Mad's plans for growth.

The suit alleges that several Apple defendants, including Apple Chairman Steve Jobs and former Apple Executive Vice-President E. Floyd Kvamme, took part in secret meetings at locations in Saudi Arabia, Las Vegas and northern California between November 1982 and January 1983 aimed at discrediting Mad and avoiding potential competition.

The suit also alleges that Apple threatened Mad employees and suppliers, delayed production and sales of the MAD-1 computer and obtained and disclosed Mad's confidential business plan to outsiders.

Mad is seeking \$1 million in damages from Apple.

It also claims that the alleged injuries sustained are valued in excess of \$10 million, an amount that could triple if the suit is settled in Mad's favor.

The dispute dates back to January 1983, when Apple terminated a distribution agreement in the Middle East with Multi-Media Video, Inc. (MMV), a Saudi Arabian distribution firm founded by John Nafeh, who subsequently left MMV to found Mad Computer in 1982. Nafeh and his company went on to develop the Mad-1 computer, an IBM-compatible machine.

Mad's complaint alleges that Apple terminated the MMV distributorship early in 1983 to cripple Mad as an Apple competitor, since Apple believed that "the development of Mad was dependent on and funded by" MMV's distribution revenues. Shortly after the termination, MMV sued Apple for terminating the contract; and the case has been heating up ever since.

The Mad suit also alleges that an earlier lawsuit, filed by Apple in California's Superior Court and based on the alleged theft by Mad of Apple's trade secrets, was a "sham lawsuit," designed to discourage potential investors from doing business with Mad. The Apple suit accuses Mad of acquiring trade secrets by hiring six former Apple employees, including Vince Brannan, Apple's former vice-president of sales.

Nafeh claims he did not attempt to hide development of the Mad computer from Apple and that the design of the MAD-1 was intended to be used with IBM-compatible software, not Apple-compatible software.

Apple's legal department would only say the matter is heading toward trial.



We must be doing something right

Over 75% of our RJE installations replaced other systems

Users say it's because HETRA goes that extra mile. From RO printer terminals to multifunction remote batch terminals, HETRA builds in the kind of reliability and provides the kind of back up support and service that makes even the toughest RJE applications work . . . and keep on working.

"For what I spent and what I got, I couldn't find another RJE system like HETRA that runs 24 hours a day, 7 days a week. Working with their people, we're continually finding ways to upgrade the system."

- Large Retail Organization

"We get immediate response from HETRA. Attention to service starts at the top and permeates throughout their organization."

- U.S. Government Agency

"We switched to HETRA from a channel extender system. Now the host doesn't crash everytime the remote system goes down."

- State Government

"When we had a problem in our switch from bi-synch to SNA, the HETRA people were constantly on the phone or at the University. They solved the problem even though the cause wasn't their equipment."

- Major University

Whether you need complex telecommunication workstations or entry level RJE terminals, you can depend on HETRA to go that extra mile to support you every step of the way.

Send me more information or	how HETRA	does it right.	Or call	305-723-773
-----------------------------	-----------	----------------	---------	-------------

Name
Title
Company
City

City State

HETRA Computer and Communications Industries, Inc., Marketing Department, P.O. Box 970, Melbourne, Florida 32901.

ng Department,



Another breakthrough for 3270 users.

Introducing the Telex 1186 Intelligent Workstation.

Here's pure intelligence in a corporate workstation. It combines standalone and on-line capability. Lets you develop off-line data files, do local processing, access your corporate data base, even transfer files to your host system. It's IBM PC compatible, too.

All that from one workstation? That's why we call it intelligent. We also call it a breakthrough in micro performance. Because it's that, too. Its 80186 microprocessor and 16 bit system make it function 2 to 3 times faster than most other micros. Plus, the 1186 utilizes MS-DOS, supports 3270 communications with Telex's optional coax feature board, and runs most standard PC software.

Here's more intelligence. We even made it easy on the user. With silenttactile PC or 3270 style keyboards, a high resolution tilt display, and space saving ergonomic styling.

And since the 1186 Intelligent Workstation comes from Telex, a recognized leader in 3270 terminals, you know you're doing business with a company that understands your needs. Plus Telex provides systems and service support from over 750 service engineers and support people

The 1186 Intelligent Workstation. If it didn't make such good business sense, you might just choose it for purely selfish reasons.

iness Machines MS®-DOS is a trademark of Microsoft Corp.



Telex Computer Products, Inc. 6422 E. 41st Street Tulsa, Oklahoma 74135 [918] 627-1111

Regional Sales Offices Cherry Hill, NJ/(609) 665-8066 • New York, NY/(212) 599-7220 • Southfield, MI/(313) 358-1195 • Atlanta, GA/(404) 955-7745 • Rosemont, IL/(312) 298-9800 • Garden Grove, CA/(714) 898-9833 • Federal Marketing Springfield, VA/(703) 922-9333 • Canada Willowdale, Ontario/(416) 494-4444 • International Addison, TX/(214) 931-8511



Automatix sells 10% interest to GM

ICCS is proud to announce Installation of the latest IDMS/ Database Software System, on our IBM 4341 Computer - a kind in educational training for the New York Metropolitan

Courses include:

Introduction to IDMS Detabase • IDMS for the Application
Programmers • ADS/On Line for the Application Programme
Henry Wang - the leading authority on IDMS, will conduct it
courses, which include intensive hand-on training in our tal
equipped with 20 IBM 3278-II and 3279 color terminals. equipped with as town across and across color terminals. In addition, you can write and test your own programs in an industry environment while you train. For further information and registration, please call: (212) 777-2483 or visit

CORPORATE TRAINING CENTER

IDMS Hands-On Training

10E 21 Street (at Broadway), New York 10010 onal Computers & Con

BILLERICA, Mass. - Automatix, Inc. announced re-cently it had reached an agreement to sell a 10% equity interest in the company to General Motors Corp., which also invested in two other machine vision companies.

GM agreed to pay Automa-tix here \$10 per share, about \$12 million, for the initial equity interest and will also receive warrants to purchase an additional 10% of Automatix shares. GM agreed to limit its ownership of Automatic warrants. matix to 20% for the next three years.

It was also announced GM will acquire up to 20% of the shares in View Engineering, a privately held firm based in Simi Valley, Calif., and a 15% equity interest in Diffracto

nounced less than one month after GM announced it would acquire Electronic Data Systems Corp. of Dallas for an estimated \$2.5 billion.

The Automatix agreement calls for GM to fund nearterm development of existing Automatix machine intelligence applications, primarily in vision, and also to fund re-search and development of advanced vision and machine intelligence systems for spe-cific GM target application areas. After an initial period, all such funded develop-ments will be exclusively licensed, under a royalty arrangement, to Automatix for manufacture and sale outside

Philippe Villers, chairman and founder of Automatix, said the arrangement "is a means of quickly channeling the world's most advanced adaptive automation to the factory floor. ... For Automatix it provides a means of funding the extensive research and development efforts required in computer-ized robotics and vision." Prior to the agreement, Automatix reportedly derived about 30% of its revenues from sales to GM.

The day after the investments were announced. Automatix reported a second-quarter loss of \$3.1 million, or 26 cents per share, compared with a year-earlier loss of \$343,000, or 3 cents per share. The company reported revenues of \$4.4 million, compared with \$2.3 million a year earlier. Automatix suffered a first-quarter loss after changing accounting policies for European sales.

Contel buys Execucom

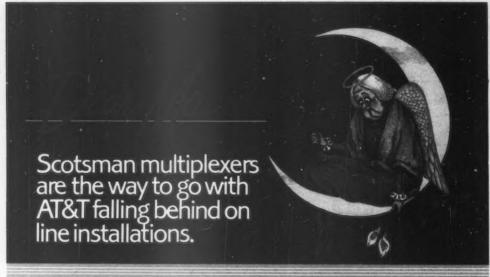
AUSTIN, Texas — Continental Telecom, Inc. (Contel) recently announced completion of the acquisition of Execucom Systems Corp., a supplier of decision support software, based here.

In late July, Execucom shareholders approved the agreement under which Control acquired French in the latent of French in the control of the control french state of the control of the c

tel acquired Execucom in exchange for Contel common stock, valued at \$18 million.

Execucom became part of Contel's Information Ser-vices Group, reporting through STSC, Inc., another member of the Contel group.

The principal products of Execucom are the Interactive Financial Planning System (IFPS) and IFPS/Personal, two decision support software products.

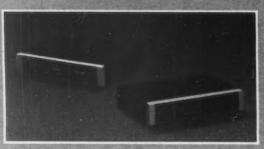


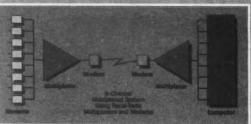
vate lines than in 1983. They miss you, Mautail Scotsman and Reduce Line CoeraHow can data network users avoid these
lays? Easy, Reduce the number of private
so by installing Scotsman multiplexers,
traman I is a high-quality, low-cost 4- or
thannel start mus with optional built-in 2400
4800 bps modern. Scotsman II is even more
ohisticated, providing system control and
onitoring. One customer saw his line costs
op from over \$1,000 to \$58 a month merely
adding a pair of Scotsman. They paid for
emselves in a few months.

Data Compressor Purther Cuts Line Costs
Racal-Vadic's new data compressor sends a
19.2 libit data stream over a single voice-grade
line using 9600 bps moderns. Or data from 4
bisync or 2 full-duplex 9600 channels can be
transmitted over one telephone line. This can
add up to great savings for users.

They're even offering FREE INSTALLATION

i doubt if you can find a better deal in aven. Ma.





RACAL

Phone (800) 543-3000, Operator 507



The Era Of The Marketcenter.

As far back as the days of Julius Caesar marketcenters have proven to be the most cost-effective way to sell products. Computer and communications companies are successfully adopting the marketcenter concept to support their marketing programs. And now, a permanent high technology marketcenter is coming to Boston in 1985.

Why Your Company Is Ready For BOSCOM Now.

BOSCOM can play an important part in your successful sales plan. First, it will be a cost-effective vehicle for the penetration of vertical markets. What this means is that qualified, potential buyers will be visiting your marketcenter exhibit. Often. Because they can find everything they need on a permanent basis under one roof.

Equally important, there is no question that Boston is in the center of high technology developments that will attract audiences both from the region, and throughout the country. One-third of

all installed computers are located in this region. As well as the strongest density of end users in the world.

What Your BOSCOM Investment Will Reap.

Once you have identified your target market segments, BOSCOM allows you to address key people under the best conditions at a time when they're ready to buy.

BOSCOM will be an effective sales tool for generating qualified leads, and a dynamic environment for product demonstrations. BOSCOM will shorten your sales cycle, and reduce your overall sales call cost, therefore increasing your sales pro-ductivity. Your BOSCOM exhibit will also serve as an important place for training, market research and communications functions

Become a part of BOSCOM now. You will assure yourself of the best exhibit space, lower rates and an important opportunity to influence the marketcenter environment for the future. Industry leaders like IBM, Xerox, Codex and Polaroid have already decided to be a part of BOSCOM.

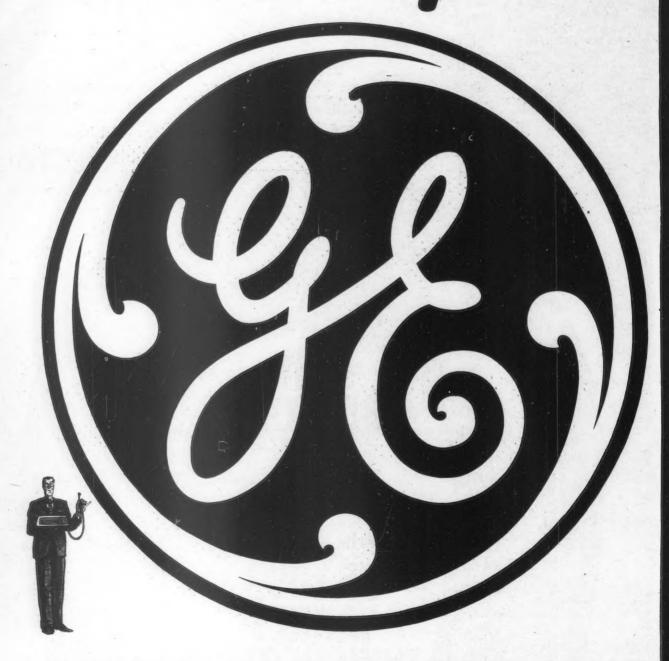
First Year BOSCOM Trade Events
Expected To Draw 200,000 Potential
Buyers.
BOSCOM currently is scheduling high
technology shows in both vertical and cross industry markets including banking, medical, insurance, small business and factory man-agement. By the fall of 1985, BOSCOM antici-pates a total of 30 shows to be booked the first year after opening its doors with a guaranteed traffic level of 200,000 people.

For further information on the high technology marketplace for today and the future call (617) 423-2340. Be at the BOSCOM marketcenter. And you'll be at the profit center of the industry.

> Commonwealth Pier, Boston, Massachusetts 02210

PROSPECTS

More byte f



Now you can get more hardware without getting more hardware. Simply link your technology with ours in a profitable partnership. Like 66% of the Fortune 500 already do.

or the buck.

We solve the problems of the new breed of MIS manager who demands cost-effective solutions.

Who insists on utter reliability.

And who desires state-of-the-art capability in a world which moves too fast for any one organization to keep up with all the latest advances.

Take our international computer network. It's the biggest commercially available network (bigger than any other network system from anyone else). It delivers information between 750 world cities in 25 countries across 23 time zones, driven by 3 superpowerful hardware centers in the US and Europe, with a system availability record higher than 99%, and with security standards second to none.

You can use it to make your information as multinational as your

company.

Or to pull all your hardware, software, systems and people together in one compatible system.

Or to provide on-line processing solutions all over the world.

Whatever.

You can also hire more analysts without hiring more analysts.

Use our 4,500 experts around the world to consult, design, program, engineer, install, maintain, train and even operate an entire international system for you—with key applications up-and-running in as little as two months (instead of the two years you might typically expect from others).

For more information, dial this number: 800-638-9636, ext. 1001.

Or contact us by electronic mail.* And get more byte for the buck.

*You can use any ASCII terminal. In the U.S. call 800-638-8369 Listen for the computer tone and insert the telephone into the coupler. Press the "H" key several times, then the carriage return key. The system will then request that you

enter a user number. Enter REK10111, GEISCO. The system will then prompt you for further information. If you want, you can even start using our QUIK-COMM electronic mail system right away.



General Electric Information Services Company, U.S.A.



MAI/Sorbus Service, a third-party computer maintenance organization, will expand its software sales program by increasing the number of its local retail outlets.

Icot Corp. announced that NCR Corp.'s third-party maintenance organization has been selected to provide full maintenance services for Icot on a worldwide basis.

The shareholders of Quality Micro Systems, Inc. approved a proposal changing the company's name to QMS, Inc.

In a move to consolidate its impact printer and type-writer businesses into one organization, Xerox Corp. announced that management responsibility for Diablo Systems, Inc. would transfer from the printing systems division in Fremont, Calif., to the information products division in Dallas.

Computer Corp. of America (CCA) and Crowntek, Inc. have announced the formation of Crowntek International Ltd. to market and support CCA's Model 204 data base management system software products in the UK. This new presence in the UK is viewed as being the first step toward establishing directly owned distribution channels to promote CCA products throughout Europe.

Mostek Corp. announced the formal opening of its new semicustom design center, located at its headquarters and main manufacturing site. The center offers convenient and comprehensive comput-

Printronix settles suit

IRVINE, Calif. — Printronix, Inc. said last month that it has settled its patent litigation suit against Mannesmann Tally Corp.

Under terms of the agreement, Mannesmann Tally will be allowed to continue manufacturing and marketing its M630, M660 and M690 printers, Printronix said in a statement. Mannesmann Tally will pay Printronix an undisclosed sum of money for each printer sold and has granted Printronix a license to certain of its nature.

to certain of its patents.

Mannesmann Tally did not admit to an infringement of Printronix patents or recognize the validity of those patents, the statement said.

er-aided design tools to let designers quickly implement their logic and system designs in silicon, the firm said.

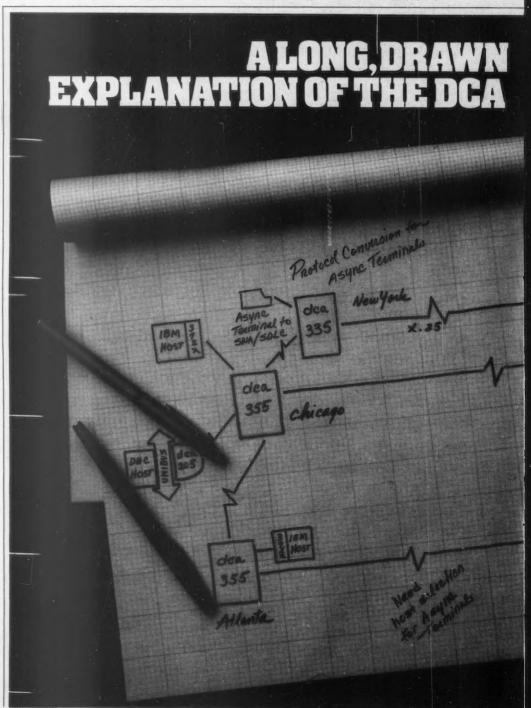
Innovatech Corp. announced the company has established a wholly owned subsidiary called Innovatech Systems, Inc. to develop integrated computer systems for automating retail business operations.

Recognition Equipment, Inc. announced the formation of its financial systems division and named John Chenault general manager. The new division will be responsible for engineering, marketing and production planning for the company's Trace II document processors and its Keyscan remittance processor.

Planning Research Corp. has been awarded a contract with an expected value of \$7.1 million to continue providing the Executive Office of the President with office automation services and data processing support. The basic \$550,000 contract extends only through September, so its subsequent option periods will correspond with the federal government's fiscal years. The contract contains three one-year renewal options, each valued at more than \$2.1 million.

VLSI Technology, Inc. and Western Digital Corp. jointly announced that a letter-of-intent agreement has been signed. The long-term agreement will feature new product codefinition and codevelopment, immediate second sourcing of specific products and certain product conversion from Nmos to Cmos technology.

Tandon Corp.'s systems division has moved its entire operations and work force from Simi Valley, Calif., to the company's plant in Thousand Oaks. Calif.



IBM from page 107

The announced compromise, in McAdams' view (see related story on page 107), may serve to relieve the psychological fear of large-system users who now have the comfort of IBM's stated intent to provide other vendors with information necessary to develop peripheral products that would be plug-compatible with IBM processors. But for U.S. mainframe vendors who are not plug-com-

patible, it is likely to mean an IBM systems approach is more attractive to users who can depend on better products at lower prices from plug-compatible manufacturers.

McAdams expressed bitterness that in 1982 the Justice Department said the U.S. antitrust action had been without merit. McAdams claimed that IBM, at one point during the course of the proceedings, had offered a compromise settlement to divest a large portion of its small systems business, valued at about \$2 billion.

"IBM clearly expected to lose [the U.S. antitrust action]," he said. "IBM restructured itself to permit the largest divestiture in history to that point." The compromise attempt died when the Justice Department insisted upon three separate companies being formed from IBM's existing businesses, rather than two separate companies, as IBM had offered.

IBM declined to comment on McAdams' claim about the compromise attempt.

During the course of the trial, McAdams himself became the center of controversy when he was accused of coaching government witnesses in preparation for their courtroom testimony. The mention of his name to this day prompts scorn from IBM executives.

IBM executives.

McAdams said the failure of the U.S. action was largely a result of the continuing

"turnover in the hierarchy" at the Justice Department during the course of the lengthy proceedings. "I served under seven antitrust [division] chiefs," he noted.

He still believes IBM has a negative impact on the information systems marketplace. "As far as monopoly power, [IBM has] got it; they've had it; and they've demonstrated it again" with the EEC compromise, he said.

IBM's reported threats to pull out of the European market rather than disclose technical information "had everyone quaking" because of IBM's large market share in

Perverse marke

Calling the present largescale systems market perverse, McAdams claimed that as a result of IBM's marketing power, "new technology outside of IBM that would permit a number of firms producing products of better quality [than IBM products] has been severely retarded."

While the U.S. government's case apparently floundered on trying to prove the distinction that IBM misused monopolistic power. McAdams said, "the crucial thing about a monopolist is that it is often able to do things based on power rather than based on quality." IBM is able to scare away competition through litigation, added. "IBM is misusing the power of litigation; it is using it offensively rather than de-

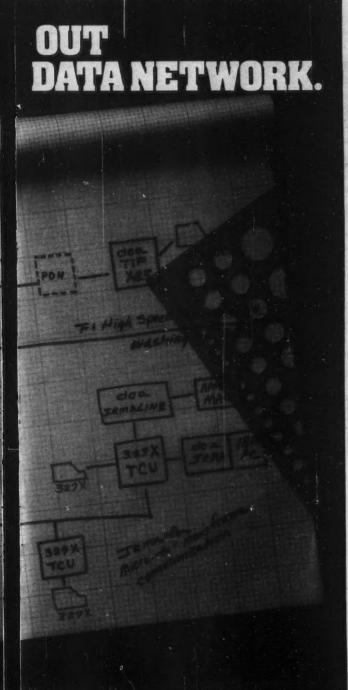
fensively."
He said IBM's success with its Personal Computer product was an example of IBM "taking over markets because of power, not quality."
IBM, according to McAdams, produced a mediocre personal computer product, but because of the IBM stature, other vendors developed a number of products to make the Personal Computer bet-

Apple an innovator

"I don't think IBM, in the [Personal Computer] case, needed to abuse power," he said. He said Apple Computer, Inc. was an innovator with its Macintosh product, but because of the "distortion to the market" caused by IBM's power, Apple is suffering because it is not compatible with IBM products.

"I don't think this is the right kind of incentive to have in an economic system," he commented. "The payoff should come from quality."

He noted that the Japanese, often cited by IBM as the beneficiaries of any disclosure requirements, have a number of companies competing on an essentially even basis. "The strength of the Japanese is their internal competition. . . . Why does IBM have to be 10 times larger than anybody else to compete?" he said.



It's really very simple: A DCA network can integrate all your datacomm equipment—IBM or non-IBM—into one flexible, efficient system. We call it Integrated Network Architecture (INA). And it offers many remarkable advantages.

Like network transparency: Our hardware is compatible with all hosts and terminals—synchronous or asynchronous. So you're free to use less expensive async terminals and modems.

Host selection: With INA, any async terminal in the network can access any host in the network. Including IBM hosts, packet mode hosts and public data networks. And any 327X terminal can access any host running 3270 BSC.

High speed transmission: You can transmit combined voice and data at speeds up to 1.544 MBPS.

Modular hardware: You can upgrade and expand your network simply by adding—instead of replacing—low-cost DCA components.

And since data is routed through a network processor instead of a dedicated host, no host software is involved and no extensive programmer training is required.

Simplicity Flexibility.

Simplicity Flexibility.

Efficiency Savings Chalk them up to INA. From DCA, 303 Research Drive,
Norcross,
Georgia 30092.
Call us toll-free:
1-800-241-5793.



MSI Data Corp. announced profits for its first fiscal quarter ended June 30 of \$249,000, or 10 cents per share, compared with \$868,000, or 35 cents per share, for the like period the previous year. Revenues were \$13.7 million, compared with \$14.1 million for the comparable period the previous vear.

Intecom, Inc. announced second-quarter revenues for the period ending June 30 of \$28.2 million, an increase of 53.2% over the \$18.4 million reported in the second quarter of last year. Profits were \$1.7 million, or 6 cents per share, compared

with \$1.5 million, or 5 cents per share, last year.

Computer Consoles, Inc. reported profits for the second quarter ended June 30 of \$2.8 million, or 23 cents per share, compared with \$2.7 million, or 23 cents per share, in the like period one year ago. Revenues were \$36.1 million, compared with \$23.6 million one year earlier.

Continental Telecom, Inc. reported revenues for the quarter ended June 30 of \$567.4 million, compared with \$528.6 million for the same pe riod last year. Profits were \$46.6 million, or 65 cents per share, compared with \$42.2 million, or 60 cents per share, for the like period one year

Reynolds & Reynolds Co. an-

nounced profits for the third quarter ended June 30 of \$4.4 million, or 94 cents per share, compared with \$3.5 million, or 75 cents per share, in the comparable period last year. Revenues were \$74.2 million, compared with \$64.1 million one year earlier.

Systematics, Inc. reported revenues for the year of \$78.7 million, compared with \$64.3 million for the previous year. Profits were \$6 million, or 56 cents per share, compared with \$4.6 million, or 45 cents per share, last year.

Daisy Systems Corp. announced revenues for the third fiscal quarter of \$18.5 million, a 262% increase over last year's \$5.1 million. Profits were \$2.8 million, or 19 cents per share, compared with \$669,000, or 5 cents per share, last year.

Applied Data Research, Inc. announced revenues for the three-month period ended June 30 of \$28.5 million, compared with \$16.7 million one year earlier. Profits were \$1.6 million, or 32 cents per share, com-pared with a loss of \$835,000, or 18 cents per share, one year ago.

Miniscribe Corp. reported that revenues for the second quarter of 1984 totaled \$35.4 million, an in-crease of 142% from the \$14.6 million reported for the corresponding period a year ago. Profits were \$2.3 million, a 156% improvement over the \$917,000 reported for the earlier period. Second-quarter earnings share were 12 cents, compared with 5 cents in the second quarter a year ago, prior to the initial public offer-See DIMES page 126

EEC from page 107

fact release interface specifications. Now they will. This will have a worldwide effect." As to speculation that IBM would simply delay its product announce-

can do that, but in the large-proces sor market that is a very short period of time. . . . Customers have to have time to plan," he said.

Whitcomb said the agreement will "relieve the FUD factor — fear, un-

certainty and doubt — among users."
Dr. Alan F. McAdams, a Cornell
University economist and a key member of the U.S. Justice Department's trial team in the U.S. antitrust case, said of the EEC compromise: "Something is better than nothing. The major impact is likely to derive from the psychological factor." McAdams said users of large systems will no longer fear that IBM might make it impossible to attach plug-compatible equipment to IBM processors. But, he added, that may not be good news for manufacturers of non-IBM-compatible equipment. The compromise may serve to encourage more users to adopt IBM-oriented systems, based on the knowledge that plug-compatible manufacturers will always be able to spur technological and price im-

its until four months prior to its ability to deliver a product, Whit-comb expressed little concern. "They

Infotron's concept for network growth opens the world for you.

> Our concept for network management puts it at your fingertips.





Centralized network management.

As your network grows-linking offices, cities o

countries—you can centralize monitoring and control functions through the ANM-800 Advanced Network Manager.

A central console controls up to 32 remote nodes. User-friendly color graphics help you tell at a glance the real-time status of the entire network. Archiving of performance information enables you to fine-tune your network and plan

future growth.
Working with information from
Infotron's 790 and 792 Network
Concentrators, the ANM-800 pro-

vides diagnostics, alarms and event reporting. All designed to help you pinpoint problems and take corrective action.

Flexibility and growth: about ANI.

The ANM-800 is a key component of Infotron's Advanced Network Integration, a concept for networking growth that means the Infotron equipment you buy now will never be obsolete. ANI also gives you the flexibility to extend your network,

expanding and reconfiguring as your needs change.

And our systems support provides the help you need—from engineering assistance to training to worldwide field service—to ensure ongoing network performance.
To find out more, send the

coupon to Infotron Systems Corporation, Marketing Depart-ment, 9 North Olney Avenue, Cherry Hill, NJ 08003. Or call toll-free 1-800-345-4636

Infotron. First in performance and reliability

Please send me more information about ANI** products, and the ANM-800 Advanced Network Manager

OTRONSYSTEMS

marketplace are starting to work IBM's official view was stated by company Chairman John R. Opel, who said: "This undertaking [by IBM] satisfies the commission's desires and puts the matter behind us without requiring us to make significant

However, McAdams said he doubts IBM will abide by the spirit of the agreement. While IBM has accepted jurisdiction of a "non-IBM-controlled forum," he said, in past instances in the U.S. where it had agreed to moderate its actions, "IBM subverted such agreements."

Industry observer Robert Djurdje-vic, editor of the "Annex Computer

Report" newsletter, said the signifi-

cance of the EEC compromise is that,

"For the first time, IBM has recog-

nized somebody else's jurisdiction over its conduct." The agreement,

Djurdjevic said, is an indication IBM is "beginning to pull in its horns a

bit." Furthermore, he added, it indicates the checks and balances of the

changes in how we do business."
Whether the agreement is substantive or symbolic, only time will tell.

Candle

The leading name in computer performance management is expanding its integrated family of MVS, IMS, CICS... and soon VM performance software products.

For the MVS installation ... EPILOG MVS, OMEGAMON MVS, and DEXAN MVS. OMEGAMON provides automatic warning of problems threatening MVS availability or performance, a comprehensive arsenal of commands to display the internals of MVS in real time, and powerful action commands through which a properly authorized user can correct problems. DEXAN MVS simplifies the complex job of tuning MVS by directly identifying and prioritizing bottleneck resources in real time. EPILOG MVS is a historical Installation Performance Management System which can quickly show the causes of MVS performance problems last night, hast week, or last month—thus helping to improve performance and prevent faiture problems.

For the GICS installation under MVS or DOS ... OMEGAMON CICS, RTA/CICS, ESRA/CICS, OMEGAMON/CICS provides automatic warning of threats to CICS availability or response time, quick identification and prioritization of system bottlenecks, over 300 commands to display how-CICS is working in real time, and powerful action commands through which a properly authorized user can correct problems and prevent CICS outages. RTA/CICS provides realtime feedback on how CICS response time is affected by shifting workloads, tuning measures, hardware and software changes, etc.—thus helping to improve end-user service, ESRA/CICS [MVS only] automatically recognizes CICS response-time problems and logs detailed information needed to diagnose and correct the problems.

For the IMS installation under MAS.

OMEGAMON IMS DEXAN IMS, and RTA/IMS.
OMEGAMON IMS provides automatic warning of problems threatening IMS availability or performance, a comprehensive set of commands to display the internals of IMS in real time, and powerful action commands through which a properly authorized user can correct problems. DEXAN/IMS simplifies the complex job of tuning MVS by directly identifying and prioritizing bottleneck resources in real time. RTA/IMS provides affected by shifting workloads, tuning measures, hardware and software changes, etc. thus helping to improve end-user service.

For the VM installation ... Candle Corporation is proud to announce that OMEGAMONA Mills will be available in the third quarter of 1984. OMEGAMONA'M will provide automatic warning of threats to VM availability or performance, a comprehensive set of exploratory commands to display the internals of VM in real time, and action commands through which a properly authorized user can correct problems and prevent system outages.

For more details or to arrange a trial of any of these products contact your Candlesa count manager

10880 Wilshire Boulevard Los Angeles, California 90024 (213) 207-1400

DIMES from page 124

ing of the company's common stock.

Computer Task Group, Inc. reported revenues for the second quarter of \$18.6 million, compared with \$13 million in the comparable period one year ago. Profits were \$511,000, compared with \$372,000 one year ago.

Ungermann-Bass, Inc. announced that revenues for the second quarter were \$12.6 million, up 133% from the comparable period one year ago. Profits were \$1.4 million, or 9 cents per share, compared with a loss of \$88,000, or 1 cent per share, in the similar 1983 period.

Hogan Systems, Inc. reported a net loss of \$1.5 million, or 11 cents per share, on revenues of \$6.7 million for its first fiscal quarter ended June 30. In the comparable period one year earlier, the

company reported revenues of \$4.2 million and no profit or loss.

Telex Corp. announced revenues for the first quarter of the fiscal year of \$97.1 million, an increase of 37% over the \$70.7 million for the comparable period last year. Profits were \$10.7 million, or 74 cents per share, compared with \$8 million, or 56 cents per share, one year ago. The recently announced acquisition of Raytheon Data Systems

tems Co. operations, effective July 1, should add about \$50 million per quarter to revenues.

Endata, Inc. announced revenues for the second quarter of \$12.3 million, compared with \$8.3 million one year ago. Profits were \$581,000, or 14 cents per share, compared with \$480,000, or 14 cents per share, reported in the comparable period of the previous year.

IWAI from page 107

Fujitsu's eventual goal is to have each of its subsidiaries operate as an independent division "completely run by American staff as a local American company," I Iwai said. To demonstrate its commitment to the U.S. market, Fujitsu has set up a semiconductor manufacturing plant in California and a fiber-optic cable manufacturing facility in Texas.

Iwai said the company has a policy of manufacturing locally "whenever possible. If everything is manufactured in Japan and sold on an OEM basis in the U.S., then eventually the volume will get so high that employment will drop in the U.S," he reasoned.

There is no best strategy for a Japanese firm to enter the U.S. market; it depends on the product, Iwai said. The OEM route is probably best for makers of large-system components, he added, while low-end products can best be sold by making use of an existing American distribution channel.

"We believe that if a Japanese enterprise can supply system components on an OEM basis to the U.S. industries, in good quality and at low cost, it will assist U.S. industries to prosper," Iwai said

Not surprisingly, Iwai shed little light on whether Fujitsu and Amdahl are nearing an agreement on the latter's marketing of Fujitsu's supercomputers in the U.S. Negotiations between the two companies have reportedly been taking place for nearly a year.

for nearly a year.

"At this point, Amdahl is just one of the possible sales channels to sell supercomputers to the U.S.," Iwai said. He was noncommittal when asked if Fujitsu could penetrate the military and scientific markets dominated by supercomputer makers Cray Research, Inc. and Control Data Corp., saying only that Fujitsu will be happy if its supercomputers are used for noncommercial applications.

About its financial stake in Amdahl, Iwai asserted that, contrary to some press accounts, Fujitsu did not make an aggressive purchase in order to take control of Amdahl. "Generally speaking, there should be no changes in Amdahl's organization and way of management," Iwai said.

He said he has been told that Amdahl employees are pleased with Fujitsu's ownership. "We believe this type of morale improvement could influence Amdahl's marketing business," he said. "Fujitsu hopes this will provide Amdahl employees with more energy in doing their [jobs] because they no longer need to worry about a liability."



While some disks lose their way in the torrid zone of drive heat, Maxell guarantees safe passage.

A lifetime warranty. And manufacturing standards that make it almost unnecessary.

Consider this: Every time you take your disk for a little spin, you expose it to drive heat that can sidetrack data. Worse, take it to the point of no return. Maxell's Gold Standard jacket construction defies heat of 140°F. And keeps your information on track.

And Maxell runs clean. A unique process impregnates lubricants throughout the oxide layer. Extending media and head life. How good is Gold?

Maxell's the disk that many drive manufacturers trust to put new equipment through its paces. It's that bug-free.

So you can drive a bargain. But in accelerated tests, Maxell was an industry leader in error-free performance and durability. Proving that if you can't stand the heat you don't stand a chance.

maxell.

Maxell Corporation of America, 60 Oxford Drive, Moonachie, N.J. 07074 201-440-8020

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION **ANNOUNCEMENTS**

SENIOR SYSTEMS ANALYST

The Pennsylvania State University Library (LIAS)
Computer Operations Div.

The heart of Pennsylvania—Nittany Valley's Centre Region and Penn State Library (LIAS) Computer Operations, offers the best of all worlds, eg., cultural events, a rural setting and a challenging work anylimpress.

environment.

A senior level position is currently available—a dynamic, creative, away-from-the-blg-city opportunity—for qualified in-dividuals to be involved in state-of-the-art software design and development of integrated information systems. Secome a member of a model-cited research and puter facilities ranging from multiputer facilities ranging facilities ranging from multiputer facilities ranging from multiputer facilities ranging facilities ranging facilities ranging facilities facilities ranging facilities rangin

Requires Bachelor's degree (or equivalent) plus 4-6 years of effective experience, preferably in library analysis, systems development and data base applications.

Liberal fringe benefits, including educa-tional privileges. Send an application letter, current resume and names of three references no later than 8/27/84 to Employment Division, 117 Williard Bidgs, Box CX-U, University Park, PA 16802. Equal opportunity/affirmative articles

OFFICE SYSTEMS PROJ. LDR.

Hitech corp. in Southern New York (not N.Y.C.) developing IBM based info. Center needs I.C. project leader. Req. knowl. of Micros, Micro Software (W.P./Spreadsheet/BASIC, etc.) Good interpersonal & training skills a must. Will manage newly established 3 person team. Dynamic company, re-laxed setting.

POSEST HALF

...

420 Main Street 1310 Liberty Building Buffalo, NY 14202 (716) 842-0801 Personnel Agency

MAINE

We have specialized in data pro-cessing professional placement in Maine for almost a fifth of a centu-ry. If you qualify for positions in the \$25-40,000 range, please contact us in total confidence. Our clients pay our fees and provide reloca-tion assistance.

38: ROMAC.

477 Congress St. Portland, Maine 04101 (207) 773-4749

lmagine building a worldwide network. data communications nup. From the ground floor up.

Then do more than imagine. Experience it. At Motorola's with a more than imagine. Experience it. At Motorola's the more than imagine. Experience it. At Motorola's experience in the control floor semiconductor. The more floor semiconductor floor floor research, development and manufacture of ground floor research, development and aunique, ground floor research, development and systems. This is a unique, ground floor f

- Become a vital member of a leading design automation team
 Start up multiple data centers
 Start up multiple data centers
 Support research and development computer-aided
 devian regions regulaters
- design projects

 Work with worldwide networked on-line systems

 Work with worldwide networked on-line systems

 Support on advanced tookwalare acceptaints.
- Work with worldwide networked on-line system
 Support an advanced technology productivity
 environment with distributed systems
 environment with distributed systems
 Support an anginagring community involved in
- environment with distributed systems

 support an engineering community involved in the

 support an engineering community involved in the

 architecture of new technologies

 Work on advanced telecommunications processors

 involving local area networks, distributed processors

 and bases and bases
 Gain experience with the new EDIF industry standard
 interchange format Can experience With the new EDIF maustry stands interchange format interchange with advanced modeling and simulation Be involved with advanced modeling and simulation
- projects
 Support many areas of Motorola CAD users and implementary
- implementors

 Work on gate array or semi-custom IC system design developments

What could be ... is. At Motorola's Semiconductor Products Sector, Engineering Information Systems and Society CAD Support Academic Sectors and Society CAD Support Academic Sectors Sectors Support Academic Sectors Sector At Motorola's Semiconductor Products Sector, Engineering The Motorola's Semiconductor Products Sector, As a start-start of the Motorola, the Information Systems and Sector CAD Support, As a start-start of the Motorola, the Information backed by industry leader as a limitles as up operation backed by industry leader as a limitles as up operation backed by industry of the Sun, with a motor of the Sun, with a many operation of the Sun, with the sun operation of the Sun ope located in Arizona's beautiful "Valley of the Sun," the opportunities for personal growth are equally impressive.

Desired requirements include in-depth knowledge of: VIM/CMS IBM SYSTEM PROGRAMMERS VM/CMS VM systems with RSCS/VCNA Networking VM systems with RSCS/VCNA Accomply Importance processing in the control of the c

- Assembly language programmins
 EXEC writing
 Also requires 5 + years experience
 Also requires 5 + ORTRAN, UNIX, C or PASCAL
 Background in FORTRAN,

TELECOMMUNICATIONS SPECIALISTS

- Local area networks
 Network design, analysis, diagnosis and management
 Network design, analysis, development
 Communications hardware development
 Tommunications hardware development
 Networks to IBM based mainframe
 Interfacing local area networks to IBM based mainframe
 Interfacing local area networks.

- Also requires 5 + years experience Satellite/microwave communications background a plus networks
 Also requires 5 + years experience

SENIOR PROGRAMMER requirements included to the page A SENIOR PROGRAMMER requirements include: • Detailed knowledge of FORTRAN or PASCAL • Graphics/CAD experience • Graphics/CAD experience • Electrical Engineering background • 5+ years experience

- Electrical Engineering background
 5 + years experience
 Familiarity with engineering data base or compiler
 Familiarity with engineering data base or compiler design a plus

 JUNIOR PROGRAMMER desired requirements include:

 Strand PASCAL

 Knowledge of FORTRAN, CMS and PASCAL

 EE courses or equivalent background

 EE courses or equivalent background

 12 years experience

- 1-2 years experience 1-2 years experience Knowledge of UNIX of C a plus

Please forward resume to Connie Rippon at Motorola Semiconductor Products Sector. 1140 S. Priest Dr., Semiconductor Products 85281. Dept. ST10, Tempe, AZ 85281.



MOTOROLA INC. Semiconductor Products Sector

HIGH TECHNOLOGY **PUBLIC RELATIONS**

ACCOUNT EXECUTIVE NEWS BUREAU MANAGER

We're New England's oldest and largest agency, and we are becoming a national leader in high technology public relations. To continue to grow at our current rate, we need to hire two of the best people in the business. Send resume and a crown letter on phone critic resear.

NEWSOME & COMPANY, INC.

225 Franklin Street
Boston, MA 02110
come & Company is a subsidiary of Carl Byoir & Associ

NEW ENGLAND EDP OPPORTUNITIES

Arizona/California/Texas/Colorado/Florida/Boston SCIENTIFIC OR BUSINESS PROGRAMMERS

If you have a BSEE, BSCS, BS in Mathematics or Physics or equiva-

If you have a BSEE, BSUS, BS at meaning the property of the pr

Tour name, resultre, and present employer will not be given out wit out your permission.

For sincere personal service, please send a confidential resume to: Dan Pullman (602) 274-5860

PULLMAN PERSONNEL 3033 North Central Ave., Suite 505, Phoenix, Arizona 85012

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

"I firmly believe that as a CIBER employee, you will advance your career more than in any other data processing environment."

> **Bob Stevenson President of CIBER**

At CIBER, we've built our reputation as one of today's leading data processing consulting firms by encouraging the career achievement and success of our professionals. This ethic of excellence is supported and success on professionals. This earlie of accentance is supported by a commitment to promotion from within. Join us, and take part in a future that promises opportunities for advancement as a consultant.

A variety of assignments provides diversified experience across many industries. You can acquire a background of skills that will include various databases, telecommunications and other software packages. Your skills are needed to help us provide the kind of serviges and technical assistance that our clients continue to re

Your benefits with CIBER include:

- Highly competitive salary
- Tax-sheltered Savings Plan
- Fully-paid Life, Health & Dental Insurance
- Tuition Relmbursement
- Relocation Assistance

If you have a minimum of 3 years experience as a Programmer, Programmer/Analyst or Systems Analyst, consider becoming a CIBER consultant. Experience with IMS, CICS, IDMS or ADABAS is preferred. If interested, call colle

Join us in a choice of locations:

Atlanta Denver Phoenix

Chicago Detroit Sacramento Dallas Houston St. Louis

An Ethic Of Excellence

67 E. Weldon, Suite 121 Phoenix, Arizona 85012 (602) 234-0411 An Equal Opportunity Employer M/F

PROGRAMMER/ It's time to migrate to PROGRAMMER ANALYSTS

PRATT & WHITNEY is seeking individuals with a Degree in Computer Science or related area Computer Science or related area and 2-5 years experience with COBOL, IBM JCL, MVS, TSO, SPF, IMS DB/DC on large IBM mair frames in the following areas:

- Business Applications
- Data Center Applications
- Operations Analysis
- IMS Data Base
- Systems Programming (MVS, VM/CMS)

The opportunities we offer combined with our excellent South Florida climate and superb recreational facilities are unbeatable – employees love it here — so will you.

Please send your resume to Professional Placement, Department CW, PO. Box 2691, West Palm Beach,

An Equal Opportunity Employer M/F





SYSTEMS PROGRAMMERS

The Standard Oil Company (Ohio), a Fortune 25 energy company, is offering the following Immediate opportunities in our Cleveland Data Center.

opportunities in our Cleveland Data Center.

NOS SYSTEMS PROGRAMMERS — You would be joining our Scientific Data Center which is at the leading edge of scientific computing technology today. The center contains two CDC Cyber 170 computers, a 175 and a 760 running the NOS 2.1 operating system, and a CDC Cyber 205 vector processor running VSOS 2.15. All three computers are connected by LCN. Responsibilities include tailoring, installing and maintaining operating systems and serving as a consultant in systems and scientific user areas, interacting with management and technical personnel. Position requirements include a 85 in Computer Science, 1 year NOS programming experience, assembly language and good communication skills.

MVS/CICS SYSTEMS PROGRAMMERS — SCHIO's Cleveland Commercial Data Center runs MVS/SP 1.3.2, CICS/VS 1.1.5 and VM/SP 3.1 with HP 03.2 on IBM 3083, CICS/VS 1.1.5 and VM/SP 3.1 with HP 03.2 on IBM 3083, 3033 and 4381 processors. System software specialists are needed to support MVS and CICS system software. Responsibilities include the installation, funing, maintenance and modification of system software along with problem solving support to end users and assisting in the evaluation of hardware and software acquisitions. You should have a BS in Computer Science, 2 to 5 years' experience with MVS, CICS, and detailed knowledge of assembler language. Strong leadership skills are a plus.

in addition to an afractive total compensation plan, SOHIO's comprehensive relocation package for new hires includes all normal moving expenses. Homeowners also qualify for mortgage interest differentic allowance, third party home purchase and other features typically restricted to internal transfers.

For immediate consideration, in complete confi-dence, send your resume outlining your background and recent salary history to:

eflich. Senior Executi THE STANDARD OIL COMPANY (Ohio) 1424 Midland Building - 681CW • Cleveland, Ohio 44115

"Help us Help to Assure America's Energy Future"



UNITED AIRLINES

SENIOR TECHNICAL SUPPORT ANALYST

Continued expansion of our sophisticated data processing capabilities has created a need for an experienced Senior Programmer Analyst to provide technical assistance and support of our 400-* minicomputer sites throughout the country. Based in our Corporate Headquarters. Complex in southwest suburban Chicago, the successful candidate will provide technical assistance to travel agency and internal organizations in analyzing and solving day-to-day hardware, software and service irregularities.

service irregularmes.

Qualified candidate will have a minimum of 3-5 years programming experience within a minicomputer environment combined with excellent communication skills. Experience with Data General hardware and/or RDOS operating systems a plus. United offers pass/reduced fare air travel privileges for employees and their immediate family members. For consideration, send resume including salary history to: Professional Employment/EXOPE/KE/CW, United Airlines, P.O. Box 66100, Chicago, IL 60668, Equal Opportunity Employer.

SR. SYSTEM DESIGNER & PROGRAMMER

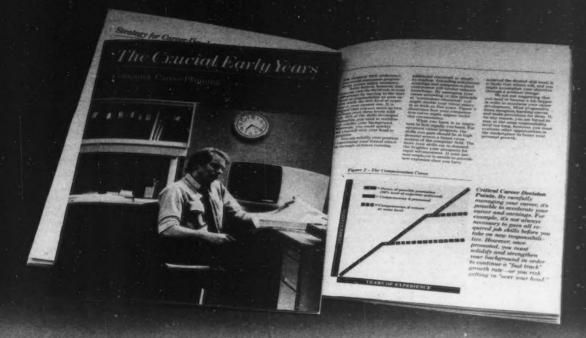
We require a college degree and 3 · 4 years experience. Training in system analysis and design techniques with special emphasis in data base design and business methods is required. COBOL and Assembler programming essential. We are currently updating our system to an IBM 4381 and require DOS experience. If you want to put your programming experience to work, send a resume with salary history to:

PERSONNEL DEPARTMENT



American Isuzu Motors Inc. P.O. Box 2280 City of Industry, CA 91746

Free planning guide to help you advance and earn more during the crucial first six years of your career



With so many changes in technology and computing, will your current skills be sought after in the future! Are you aware of all your career options? What are you doing to make sure your career won't become stagnant or falter? And, more importantly, is your career keeping pace with today's opportunities?

The Crucial Early Years provides information on techniques that you can use to assess the quality a value of your current experience, how to gain full awareness of all your career options and how you can capitalize on this information. You'll also learn:

Colorado

- How to accelerate your career and earnings by as much as 100% in the next few years
- · How to solidify and strengthen your background each time you advance in your career
- · When you should-and shouldn't-make a career
- The significance of the "80/20 Rule" and how to use it to your advantage

You owe it to your career to call Source Edp and reque a copy of this valuable report. Effective planning is especially important during the first two to six years of your career, and The Crucial Early Years can help you establish a solid foundation that will help assure your long-term development. There is absolutely no cost or obligation in exchange for this free report-or for any of our services; career planning, counseling or placement. Simply call your nearest Source Edp office today.

Call today

Call the Source Edp office nearest you for a free copy of The Crucial Early Years. We'll mail a copy to you in strict confidence, without obligation.

If unable to call, write:

Source Edp Department CE1 P.O. Box 7100 Mountain View, CA 94039

When writing, please include

your title. United States:

Alabama 205/322-8745 Arizona 602/279-1010 California Northern Sacramento 916/446-3470 n Francis Southern 714/738-1313 Irvine Los Angeles outh Bay

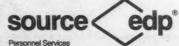
619/231-1900

303/773-3700 Connecticut 203/797-0590 New Haven 203/787-4595 Waterhury 203/574-5633 302/652-0933 District of Columbia 202/293-9255 Washington D.C. .. Fort Lauderdale lacksonville 305/624-3536 Georgia Atlanta/Downtown ... Atlanta/North Atlanta/Perimtr. 400 ... 404/953-0200 Chicago/E. Loop 312/861-0770 Chicago/W. Loop ... Oak Brook Rolling Meadows 312/346-1280 312/986-0422 312/392-0244 219/432-7333 Fort Wayne Indianapolis Des Moines 515/243-0191 Kansas Overland Park 316/688-1621 Wichita Kentucky 502/581-9900 Louisville 504/924-7183 Baton Rouge ...

Greenbelt Boston Burlington Springfield 617/273-5160 Michigan Detroit Grand Rapids 313/259-7607 517/484-4561 Southfield Troy 612/544-3600 St. Paul . 612/227-6100 Missouri St. Louis . 314/576-4444 Nebraska New Hampshire 603/888-7650 New Jersey Morristown 201/267-3222 201/845-3900 Princeton 201/469-9444 New Mexico 505/247-4270

New York Albany	
Albany	518/482-2035
Buffalo	716/835-9630
New York City	
Grand Central	212/557-8611
Penn Station	
Wall Street	212/962-8000
Rochester	716/263-2670
Syosset, L.I	516/364-0900
Syracuse	315/422-2411
White Plains	914/694-4400
North Carolina	
Charlotte	704/552-6577
Greensboro	919/379-1155
Raleigh	919/847-7605
Winston-Salem	919/724-0630
Ohio	
Akron	216/535-1150
Cincinnati	513/769-5080
Cleveland	216/771-2070
Columbus	614/224-0660
Dayton	513/461-4660
Toledo	419/242-2601
Oklahoma	
Oklahoma City	405/722-7410
Tulsa	918/599-7700
Oregon	
Oregon Portland	503/223-6160
Pennsylvania	
Harrisburg	717/233-8066
King of Prussia	215/265-7250
Philadelphia	

	Rhode Island	
518/482-2035	Rhode Island Providence	401/751-0065
716/835-9630		
	South Carolina Columbia	803/256-7446
212/557-8611	Greenville	803/271-7044
212/736-7445	Tennessee	
212/962-8000	Nashville	615/256-0625
716/263-2670	Tevas	
516/364-0900	Austin	512/479-0720
315/422-2411	Dallas	
914/694-4400	Central	214/954-1100
	North	
704/552-6577	Fort Worth	817/338-9300
919/379-1155	Houston	
919/847-7605	Downtown	713/751-0100
919/724-0630	Galleria/Post Oak	713/439-0550
	San Antonio	512/342-9898
216/535-1150	Utah	
513/769-5080	Salt Lake City	801/966-3900
216/771-2070	Vincinia	
614/224-0660	McLean	703/790-561
513/461-4660	Washington	
419/242-2601	Washington Seattle	206/454-640
	Spokane	509/838-787
405/722-7410	Wisconsin	3471030 101
918/599-7700	Green Bay	414/432-118
	Madison	
503/223-6160	Milwaukee	
		11 11 11 10 1
717/233-8066	Ontario	
215/265-7250	Mississauga	. 416/848-334
215/665-1717	Toronto	
412/261-6540	Willowdale	



POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

The Business Of Telecommunications

...For Data Processing Professionals It Can Be The Key To Advancement With Northern Telecom in Raleigh, NC

At our facility in Research Triangle Park, N.C., our Digital Switching Systems Group is developing new systems to satisfy growing world demand for improved communications. To keep pace with a growing work force and business base, we have made a strong MIS commitment which has created the following professional openings:

Manager, Business Systems Services: Manages all operating functions of a large data center to include providing data processing and software planning services throughout Digital Switching Systems groups and coordinating efforts with other data centers in the U.S. and Canada as required. Develops computer operations and telecommunication plans, ensuring hardware and software compatibility. Plans and directs changes and improvements to hardware and software. Degree in Science, Engineering, or other technical area required, plus a-minimum of 10 years experience in EDP operations management. (WM1)

Computer Operations Coordinator: Coordinates all operations aspects in a multi-computer, multi-site environment and directs operations schedules and tape librarian. Offers guidance to operations supervisor to ensure compliance with standards and operating procedures. Requires an Associates degree or equivalent, and 4 years of experience in multi-processing

Database Analysts: Assists in the development and implementation of strategies necessary to maintain an effective data administrative base. Provides technical analysis and planning for database technology and ensures effective database integration and availability. Assists in the research and appraisal of database technology and systems architecture trends, and new hardware. Requires a BSCS, Business, or equivalent, with 2 to 4 years database administration experience including system design with on-line, DBMS application. HP/IBM experience preferred. (DY1)

Sr. Systems Analyst: Analyzes systems, recommends enhancements, and identifies associated cost improvements. Coordinates programmer related activities to ensure all programs are well documented, meet specifications, and conform to standards. Prepares system test plans and coordinates system testing, parallel processing and system implementation. Requires a BSCS, or equivalent, and 5 to 7 years of experience with IBM/VM operating systems. (JF)

Business Methods Analyst: Responsibilities include methods improvement, paperwork control, office automation, and communications management. Requires an Industrial Engineering, Business or Commerce degree, or equivalent, along with 2 years of business methods application experience. (BB)

Sr. Analysts/Programmer Analysts: Requires a BSCS, or equivalent, and experience with one or more of the following: HP 3000/HP 1000, IBM VM/MVS, Rapid/3000, Ramis 11, COBOL/Fortran, or related systems. (KG)

We can offer industry competitive compensation, excellent potential for advancement and benefits that include relocation assistance to the Raleigh, Durham, Chapel Hill area. Our location offers the amenities of a cosmopolitan city, combined with the low costs and quiet lifestyle of the "New South." For confidential consideration, please send your resume (Indicating poettion of Interest to you)

Manager, Professional Staffing-CW813 Northern Telecom Inc. Dept. BE, Box 13010 4001 E. Chapel Hill-Netson Hwy. E. Chapel Hill-Nelson Hwy. rch Triangle Park, N.C. 27709



We hire talent

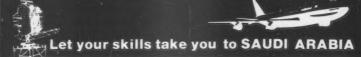


Bendix Field Engineering Corporation

, our skills and innovation reach around the globe. We are currently seeking Specialists to assist in the programming and analysis of the Saudi Arabian Air

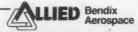
DATA SYSTEMS SPECIALIST

(Programmer/Analyst)



The position requires a Bachelor's degree in Mathematics, or equivalent, and 6 years experience in programming and analysis in high level Assembly language related to scientific or air traffic control applications.

At BENDIX FIELD ENGINEERING CORPORATION, we reward skills and dedication. Our employees in Saudi Arabia receive competitive salaries, overseas allowance and completion bonuses. We also offer free transportation, two leaves per year, subsidized meals, and free housing. For more information on to become a part of this exciting organization, forward your resume or call: TOLL FREE: 800-638-2998, Mon.-Frl., 8AM-4PM(ET), Bendix-ATC-NA03A, 9017 Red Branch Rd., Columbia, MD 21045.





PROGRAMMER/ANALYSTS WITH MSA G/L, A/P EXPERIENCE, WHY NOT CONSIDER JEPPESEN SANDERSON AND COLORADO?

- Unique Opportunity Valuable Experience

- * Professional Tear
 * Terrific Potential

An on-line development project using the latest data base technology is just getting off the ground at Jeppesen Sanderson, using a new IBM 4381 computer system. We are seeking a Programmer/ Analyst with involvement in the IDMS environment and with actual MSA installation experience in General Ledger and Accounts Payable. COBOL and good communication skills are required, and manufacturing background is a plus. MVS/SP, VSAM, and TSO are desirable.

The position requires a Bachelor's Degree in Computer Science or related area, plus two years of experience in the installation/integration of MSA software, or an equivalent combination of education and experience.

sen Sanderson is the world's leading publisher of aviation flight charts and training materials, and offers a pleasant, profes-sional working environment, excellent salary and fringe benefits package, and opportunity for growth and advancement. Relocation expenses can be con

If you qualify for this position, please send resume to:

Robert Muller, Personnel Director

JEPPESEN SANDERSON

55 Inverness Dr. East Englewood Cb 80112

EDP Auditor

Promotions and expansion of the corporate auditing staff at NCR in Dayton have combined to create an opening for an EDP Auditor. As a \$3.7 billion multinational computer company, we can offer you ex-ceptional opportunities for career advancement.

Your credentials must demonstrate a thorough knowledge of DP systems and programming, with experience in one or more of the following: Cobol, Total, IRX, VRX, URIX (trademark of AT&T Bell Labs), You should have or expect to have certification such as CPA, CMA, CIA or CISA. Based in Dayton, you may anticipate about 50% domestic travel and the prospect of international assignments.

To investigate competitive salary, comprehensive benefits and advancement in a company celebrating 100 years of success, send confidential resume with salary history to: Ms. Margaret H. Knight, Personnel Resources, Corporate Finance and Administration, NCR Corporation, Dept. U-56 Dayton, Ohio 45479.

Celebrating the future

An equal opportunity employer

We'll give YOU Silicon Valley!

ou've heard about the legendary companies here, if you've thought of inling one of them, let us help you make the connection. We've been ere since the legends started, and know the right people in the right

piaces.

There's a special need right now for technically qualified professionals in MIS and in marketing and sales in the computer vendor field. One of these positions could lead to the start of your own legand. Send your resume today, or call. All fees, interview, and relocation expenses are poid by our clients.

Computer Resources Group, Inc., ogarcy 3080 Olcott St., Santa Clara, CA 95051, (408) 727-1658; or 303 Sacramento St., San Francisco, CA 94111, (415) 398-3535





POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

Support Sets Us Apart

Cullinet's dedication to customer satisfaction has made us the most successful and respected name in software products. We take the best technical professionals and put them where the action is: Interacting with our customers to help them get the most out of Cullinet's advanced software solutions. It's support like this that insures the continued growth and success of Cullinet,... and your career.

Applications Support

In-House Customer
Support Reps
with excellent problem-solving and analytical skills to work with Cullinet customers in telephone support of our Human Resources Applications software products. To qualify, your background should include 3 or more years in data processing as an applications programmer, with at least one year in personnel and/or payroll applications, working directly with end-users. You should have excellent interpersonal skills, and be familiar with on-line systems, preferably CICS or IDMS/DC, and database applications (IDMS or IMS).

Manufacturing

Applications
Support
We have several openings for highly-talented support
Support
Gle a variety of support roles concerning our Manufacturing Applications software products. To qualify, you must have 3 or
more years' applications support experience, preferably in an IMS, IDMS
environment.

Marketing Support And **Customer Support**

- Financial Applications Software
- Manufacturing Applications Software
- Database Software

We have a number of challenging openings for highly talented support professionals in the above areas of data processing expertise. To qualify, you must have 3-5 years of data processing experience in an IBM mainframe environment.

For the Customer Support positions an in-depth knowledge of database and/or the above applications areas from an installation or systems analysis viewpoint is required. Good communications skills and an understanding of the user environment are a plus.

The above opportunities are available in Boston, NYC, Chicago, Philadelphia, Toronto, and other major cities throughout the U.S. and Canada.

Technical Support

Technical Support
Representatives
ence in an IBM environment to be involved in a variety of Technical Support roles. IBM Assembler language skills are essential. Experience with database systems, and MVS/DOS/VM systems programming is highly desirable. We currently have openings for professionals who would like to work with Cullinet customers in the following functions:

- Installation Support for our customer base and technical staff. Experience in Systems Programming and knowledge of VM, DOS, and VSE
- Data Dictionary Support. Database management experience and strong Assembler language skills required.
- IDMS/R Support. Database management experience and Assembler language skills required.
- IMS DC Support. Strong Assembler language skills and database ex-perience are desirable. Requires in-depth background in internals with TP or CICS, IDMS/DC or other monitor.
- Interact Support. Strong Assembler language background. MVS Systems programming experience desirable.
- ADS/O Support. Strong Assembler language background. Knowledge of data base management desirable.
- Culprit Support. Strong Assembler language background. Knowledge of database management desirable. Operating Systems experience

In addition to the openings in our Corporate Facility in Westwood, we are looking for Technical Support Reps for Chicago, Atlanta, Los Angeles and Philadelphia. Support Reps based in Philadelphia must be fluent in the French language.

Development

Applications

Software
Development

Challenging opportunities to develop a fully integrated set of human resource, manufacturing and financial products in an on-line database environment. Requires a minimum of 2 years' applications development experience; database and on-line background desirable.

• Human Resource Systems

Contribute to the design and development of payroll and personnel as well as associated human resources modules using IDMS and ADS on-line

Participate in the development of general ledger, accounts payable, accounts receivable, purchasing, and order entry; all integrated in an IDMS DB/DC environment.

Manufacturing Systems

Development of bill of material, cost control, inventory control and master production scheduling. Fully integrated with the financial systems

Software Technical Writers

Working closely with development, editorial, and publication staffs, you'll design and write user and system documentation for database and applications software.

To succeed, you should possess a minimum of 1-2 years' software technical writing experience. The ability to work independently on a variety of projects and good organizational skills are essential.

Human Resource/Payroll Applications

Requires familiarity with payroll or personnel functions and experience with payroll or personnel application software.

• Financial Applications

Requires an understanding of accounting and experience with general ledger, accounts payable, or accounts receivable application software.

Manufacturing Applications

Familiarity with manufacturing concepts such as MRP and MPS, or ex-perience with manufacturing applications software required.

Database Systems

Requires a solid understanding of database concepts.

Sales Training

Manager/Sales In this exciting ground floor opportunity, you will utilize your excellent communications and presentation skills, as well as creativity, to assist the Director of Training in building a superior department while you develop a multilevel Sales and Sales Management training program. To qualify, you must have 5-10 years of experience in Sales/Sales Training, plus an in-depth understanding of the concepts and functions of both software-and hardware in the IBM mainframe (plug compatible) environment.

Sales
Trainer

Here's the ideal opportunity for a Technical Sales Support or Systems Engineering Professional to get involved in training. In this unique, start-up training situation, you will develop course qualify, you must have 5+ years of sales or marketing-oriented Systems Engineering experience in an IBM mainframe (plug compatible) environment. Good presentation and communications skills are essential.

The above opportunities are available in our Corporate facility located in Westwood, Massachusetts.

Interested candidates please reply with resume and salary history to the appropriate contact listed below, at:

Cullinet Software, Inc. 400 Blue Hill Driv

Technical Support, Development and Applications Support - Frank Emro Sales Training, Marketing Support and Customer Support - Roy Evarts. An Equal Opportunity Employer

Cullinet

MOVE UP TO COLORADO!

Colorado and Storage Technology have teamed together to offer you a lifestyle and a career opportunity second to none. Storage Technology, a For-tune 500 company located just minutes from Den-ver and the majestic Rocky Mountains, is a leading manufacturer of high performance computer peripheral equipment.

DISK VALIDATION SOFTWARE ENGINEERS

As part of the engineering validation test team, you will design, develop, and execute I/O intensive software for testing on engineering prototype disk subsystems. You will lead the validation of disk products by working in a multi-CPU, handson environment with the development engineers.

Positions require a minimum of 2 years software expe plus proficiency in assembly language programming. Desirable skills include knowledge of IBM 370 architecture (especially the I/O subsystem), IBM BAL, working knowledge of I/O supervisor internals, and ability to perform computer opera-

DEVELOPMENT ENGINEERS: STAFF, SENIOR

Be part of a team whose charter is to design and develop IBM-compatible disk control units. The team will be responsible for implementing logic design in semicustom CMOS or ECL gate arrays. CAD will be utilized as proof of design, in array, card and multicard logical simulation.

Storage Technology is continuing to break new ground in the application of optical technology to data storage products. Due to the outstanding response, we are currently staffing programs to further enhance our existing product line and develop new optical storage products for future applica-tions. The optical disk division has current needs for:

SENIOR SERVO ENGINEERS

Responsibilities include the conceptual design and specifica-tion of precision servo systems. Extensive experience in cir-cuit design including analog/digital interface circuits, phase locked loops, power amplifiers, transducers, and detection circuits is necessary. A thorough understanding of circuit in-teraction and system stability is required. BS, MS/EE and a minimum of 5-7 years experience is required.

OPTICAL ENGINEERS

Career opportunities exist in all the optical engineering disciplines including optical drive and media development, me-chanical optical design, optical recording, optical manufactur-ing, thin film process, and optical QA.

TEST/STAFF ENGINEERS

You will be part of a UNIX programming team involved in the design and implementation of a large scale automated test floor software system written in the C language. Expertise in any or all of the following areas is required: design and implementation of manufacturing systems, quality assurance systems, and local area networks. Knowledge of communications and computer hardware is desirable. BSCs or equivalent is required. Salary and grade will be commensurate with experience.

Storage Technology offers a comprehensive benefits package that includes health, dental and life insurance, stock option plan, competitive relo cation assistance and much more. Please forward your detailed resume in complete confidence to Bill Mattocks, Storage Technology, MD 29, Dept. 0813, #29, 2270 South 88th Street, Louisville, CO 80028. Equal opportunity employer.



StorageTek

EMPLOYMENT SERVICE FOR PROGRAMMERS AND ANALYSTS

National Openings With Client Companies

And Through Affiliated Agencies

Scientific and commercial applications * Software development and systems
programming * Telecommunications * Control systems * Computer engineer
ing * Computer marketing and support

Call or send resume or rough notes of objectives, salary location restrictions education and experience (including computers, models operating systems and languages) to either one of our locations. Our client companies pay all of our fees. We guide, you decide

RSVP SERVICES, Dept. C Suite 700, One Cherry Hill Mall Cherry Hill, New Jersey 08002 (609) 667-4488

RSVP SERVICES, Dept. C Suite 211, Dublin Hall 1777 Walton Rd., Blue Bell, PA 19422 (215) 629-0595

RSVP SERVICES

Programmers, Analysts, Software Specialists: Let us assist you in your career advancement as we have hundreds of computer profes-sionals like yourself since 1970.

In Dallas, our clientele consists of virtually every major data processing installation as well as numerous smaller organizations. Nationally, through our network of 30 offices, we represent thousands of career opportunities across the entire U.S. Send our profession-als your resume or call us today!



DataPro DATA PROCESSING
PERSONNEL
CONSULTANTS

12720 HILLCREST - SUITE 520-N DALLAS, TEXAS 75230 (214)661-8600 All fees paid by client companies

Computer Associates



As recognized leaders in the wafer processing and stepping industries, the people of Eaton Microlithography Systems have much in common. They possess the declication and skill to create the technical standards of tomorrow. And they share in the rewards of Eaton's success. Reward such as professional career development, involvement in future technologies. And a progressive work environment. If you believe the best working relationship offers an equal return on investment, make our success yours. At Eaton Microlithography Systems. The following opening is now available.

PROGRAMMER ANALYST

As Programmer Analyst, you will be responsible for the design, development, modification and evaluation of business applications program toward solving related problems. Will also analyze existing programs and/or formulate logic for new systems, devise logic procedures and flow charts, code and test and debug programs. This senior level position requires at least 3 years experience on System 3 using RPG III and CLP in an interactive manufacturing systems nt, with a BS degree preferred.

Eaton offers a progressive work environment, competitive salaries, and excellent benefits. Come share in our success. Please sent resume to Eaton Corporation, Microlithography Systems Division, Human Resources Dept. SC, 910 Benicia Ave., Sunnyvale, CA 94086. An Equal Opportunity/Alfirmative Action Employer.

Where the success is mutual

FIT Microlithography Systems Division

ON YOUR CAREER INVESTMENT

IBM Account Manager

(Mid-Hudson Valley)

Truu will be reporting to our Boston office and it will be your strategies that could launch years of programs, lasting into the next de-cade. B.S.E.E. required, M.B.A. a plus. 5 or more years of experience in our business is

We offer fully paid medical and dental coverage and attractive compensation. Please send your resurre with salary history for Sales Manager, Dept Dri, Mrt Stellish R. ElecTRONCS.
AMERICA, INC., 201 Lincom Park Drive, Woburn, MA 01801. We are an Equal Opportunity/Affirmative Action Employer. PRINCIPALS ONLY, PLEASE.

Mitsubishi **Electronics** America, Inc. Semiconductor Division

NBS HIGH PERFORMANCE COMPUTER MEASUREMENT PROGRAM COMPUTER OPERATING SYSTEMS DESIGNERS

d COMPUTER SCIENTISTS/ELECTRICAL ENGINEERS are needed to perform advanced closely coupled multiprocessor computer systems. Major thrusts of the activity include:

multiprocessor operating system design and m
 multiprocessor compiler design and measurem
 measurement systems for multiprocessor hard
 benchmarking techniques.

For Computer Scientist positions, a graduate or undergraduate degree which consists of 30 semester hours in mathematics, statistics and computer science including differential and integral calculace courses) plus a minimum of three (3) years of appointers in the computer science field are required. Positions are also available for Ph.D's in computer science or related fields.

ositions, experience in advanced development of multiprocessing/parallel sired. A Ph.D in computer science or electric engineering or a related field

thorough practical knowledge of the internals of the UNIX operating system is strongly de-ed. Knowledge of MC 68010 architecture is desired. Research or advanced development perience is nothware for multiprocessor architecture is desired.

experience in software for multiprocessor accreascular to vession.

Electronical Engineer - candidates must show successful competent on a full 4-year professional engineering curriculum leading to a bachelor's or higher degree in engineering in an accredited object or university. To be acceptable for the curriculum mast: (1) be in a school of engineering with at least one curriculum accredited by the Accreditation Board for Engineering and the state of the school of the sc

U.S. Department of Commerce National Bureau of Standards ATTN: Ms. Vicki Southers (Code: CW1357) Administration Building A-123 Gaithersburg, MD 20899

The National Bureau of Standards is an Equal Employment/Affirmative Action Employer lo-cated in Gaithersburg, Maryland, U.S. citizenship is required.

500 DP Openings

20-29K 28-35A 21-28K 21-28K 25-40K 24-30K 24-30K 23-32K 25-34K 25-39K 27-40K 27-40K 27-40K 25-35K High Principal (b) you find you. Eller of COLD memories The global of you find. COLD ACT PRINCIPAL (b) Find (c) Find

Rick Young, CPC (704) 386-1800 Corporate Personnel Consultants, Inc.

3705 Latrobe Drive, Suite 310 Charlotte, N.C. 28211

HOW TO MAKE OVER \$80,000.00 A YEAR ON CICS COMMAND LEVEL PROGRAMMING

Acquire no of the most demanded & rewarding programming skills in months. A complete & practical guide to CICS command level programming, It's based on CICS latest version 1.6, examples are written in COBOL, with special emphasis on VSAM. It covers virtually every CICS technique you'll ever need. 15 sample programs address all CICS major technical applications. Over 150 ready-to-use examples. Handson mylar-coating overs, contents printed in the colors. Brand-new second edition. Big 8.5" x 11" size. Over 7000 copies have been sold during the last 10 months. Written by top-notch CICS consultant in the country. Designed to cut your learning curve at least in half. Also tips on moonlighting and contracting on CICS projects.

You must be satisfied or you'r money back, no matter how long you've had it. But act now! Send \$34.95 (plus \$2.00 for P & H) in check or M.O. (Visa & M/C Welcome) to:

CCD Online Systems, Inc. 6313 Crested Butte Drive Dallas, TX 75252

(Allow 1 or 2 weeks for delivery)

IF MOST OF YOUR GROWTH IS IN THE PAST, CONSIDER A MACRO-CAREER FUTURE IN MINI-COMPUTER SYSTEMS WITH PERKIN-ELMER.



Everything you want in the career future you expect!

Perkin-Elmer made computer history in 1974 when our 32-bit mini was introduced. It was the first mini designed to handle "maxi" tasks, and was a major advance in data processing capabilities.

And this was just a prelude to technological advances to come. We followed one breakthrough with another, and called it EVERYWARE™— a comprehensive line of computer hardware and software. EVERYWARE™ furthers the famous Perkin-Elmer tradition of superior design and unparalleled quality.

We are excited about today's possibilities for our advanced systems, but even more enthusiastic about what the future holds. Our strong position in the mini-computer market, with an installed base of over 5,000 units, is expanding at a phenomenal rate.

Perkin-Elmer continues to be a "company on the move", as we introduce new products and penetrate new markets — creating exceptional opportunities for career advancement in Mini-Computer Sales and Support.

Move up from a mini- to a macro- career future with an industry leader in one of the following positions:

SYSTEMS ANALYSTS

Because we're selling total systems solutions, not merely computers, our systems analysts act as consultants from the start of the sales effort. Working closely with our sales representatives you will have a broad product line available to meet clients' needs — from supermin's to our new workstations.

Qualifications should include a technical degree and 3-8 years of systems analyst experience in 2 or more of the following areas: operating systems (UNIX™), knowledge of hardware configurations, data communications (i.e., SNA, LAN and X.25), data management systems, scientific tanguages, and real-time computer operations (i.e., flight simulation).

SALES REPRESENTATIVES

You must have a minimum of 3 years technical experience selling mini-computers. Excellent communications skills, knowledge of UNIX™ and FORTRAN, technical competence in hardware, and proven ability to develop new accounts are essential prerequisites: BS degree in a technical field or its equivalent is preferred. Salary, commission, bonus plan, and car allowance comprise the remuneration.

A future with Perkin-Elmer is a future full of career satisfaction, opportunities for advancement, and the rewards of performing well for a company quick to recognize talented individuals. Enlarge your expectations to include a macro-career, today, by sending your resume and salary history to: A. Borkin, The Perkin-Elmer Corporation; Data Systems Group, 2 Crescent Place, Oceanport, NJ 07757. No phone calls please.

An Equal Opportunity Employer M/F

PERKIN-ELMER

The science <u>and</u> computer company. Where solutions come first.

DATA PROCESSING **PROFESSIONALS**

Riggs National Bank... Our reputation and your expertise. An unbeatable combination.

We are Riggs National Bank, one of the largest—and oldest—financial institutions in our Nation's Capitol. We've built a solid reputation on our experienced team of professionals and a stable, secure environment. You'll find challenging assignments, interesting projects, and, most importantly, professionalism

We are currently installing a new software package-HOGAN- and seek experienced individuals who are interested in joining a new, exciting, and growing Department. Our new systems include the following:

- Umbrella System

- Prophet System
 Integrated Loan System
 On-Line Collection System
- · Management Systems for International Banking (formerly Henco)

We require a minimum of 3 years' experience (IMS DB/DC, CICS, OS/MVS, COBOL, PL/1–HOGAN is a plus) for the following openings:

- * Senior Data Base Analysts
- Senior/Lead Programmer/Analysts
 Senior Documentation Specialists

- Operations AnalystsProgrammer/Analysts

Degreed individuals preferred-(Computer Science a plus).

In return for your expertise, we can offer you excellent salaries, a comprehensive benefits program (including tuition assistance) and a professional atmosphere, conducive to your career development. For an immediate response, please forward your resume, stating your background, salary requirements and positions preference, to: Ms. Lisa C. Cohen, Human Resources, Riggs National Bank, 1120 Vermont Avenue, N.W., Washington, DC 20005. We are an equal opportunity employer M/F.

> The most important bank in the most important city in the world.



HARDWARE AND SOFTWARE **PROFESSIONALS**

We have been retained to locate qualified professionals for a large multi-disciplined corporation strategically located at the puls technological advancements in the Mid-Atla states.

Senior, Mid-level and Junior Hardware or Software expertise in any of the following areas are desired:

REAL TIME SYSTEMS DIGITAL SIGNAL PROCESSING DIGITAL AND ANALOG ENGINEERING LIST DESIGN
MINI OR MICRO APPLICATIONS
DATA COMMUNICATIONS
DATA SWITCHING
QUALITY ASSURANCE QUALITY ASSURANCE
EW SYSTEMS
NETWORKING
TEMPEST
DATA BASE SYSTEMS
COMPUTER SECURITY
SATELLITE SYSTEMS
MESSAGE PROCESSING
ARTIFICIAL INTELLIGENCE
E.O. SYSTEMS
RF SYSTEMS
COMSEC
SIGINT/ELINT

Many of these positions require top secret clearance with special background investigations, all require U.S. citizenship.

Excellent benefits, highly competitive salaries and relocation benefits make hundreds of openings very

TAKE CHARGE OF YOUR CAREER! SEND US YOUR RESUME TODAY!

Logan Technical 🏖 Professional Services

Placement Consultants 1901 North Moore Street, Suite 208 Arlington, VA 22209 (703) 522-6547

Our client is an equal opportunity employer

PROCESSING **PROFESSIONALS**

r Contract Programming and ng. Our growth in the st and Southwest has copportunities for versatile onals with state-of-the-art Programming and Systems

immediate consideration, sume to 3301 Buckeye Rd., S 103, Atlanta, GA 30341, or ca BECKY FINLEY or JIM BARRETT at 404-455-7260, or toll free:

1-800-241-6002

DRC

DP POSITIONS SEATTLE/PORTLAND

Programmer/Analyst..... nancial app. CICS/DL1 on line inti Programmer/Analyst CICS/DL1 or VSAM on-line dev

HOUSER, MARTIN MORRIS & ASSOC.

(206) 453-2700 -90015, 1940-116th Ave. N.E Bellevue, WA 98009

Join The Computer Horizons IMS TASK FORCE Of Industry Elite In California

As a talented EDP Professional ready to make that major career move to Consultant status and eager to elevate your technical background, this is your big chance.

Computer Horizons Corp., the dynamically growing, publicly held and nationally respected consulting firm with offices across the United States is once again expanding the CHC Task Force of Elite EDP Professionals to "spearhead" major projects for clients located throughout California.

We are interested in Sr. Programmer Analysts, Programmer Analysts and Programmers with design or implementation experience in IMS. In addition, we are interested in D.P. professionals with an OS/COBOL or PL/1 background to be immediately put into our intensive IMS training course which will enable you to become part of our IMS Task Force.

sitions are currently available in San Francisco, Los Angesand San Jose.

These positions are diverse and challenging every step of the way. The rewards are truly significant. Earnings from day one are far in the excess of industry standards and a comprehensive benefits program that includes life, health, major medical and dental insurance, unlimited tuition refund plus relocation and travel assistance; also included is our deferred income savings plan. Please respond by calling or sending your resume to:



^a COMPUTER HORIZONS CORP.

235 Montgomery Street, Suite 706 San Francisco, CA 94104

EXECUTIVE DIRECTOR MANAGEMENT INFORMATION SYSTEMS

MANAGEMENT INFORMATION SYSTEMS

The University of Pennsylvania, one of the nation's leading private research universities, is seeking an Executive Director to lead its Management Information Systems Office. This office is responsible for information systems office. This office is responsible for information systems development, installation and operation for an institution of 17,400 faculty, and staff and 23,000 students. The University has begun a new and vigorous effort to create distributed office systems which use a shared data base for student, finance, personnel and research administration. The Executive Director will work with a staff of 75 and with management and staff across the University to bring these systems to effective operation. The position requires an individual with senior management experience in data processing, excellent interpersonal skills and a familiarity with private, research oriented universities. The Executive Director will report to the Vice Provost for Computing and will work closely with the Provost and Senior Vice President of the University. Compensation will be commensurate with experience, in addition to an attractive benefits package. Please send two copies of your resume, postmarked no later than September 10, 1984 to: Gerri H. Walker/UMIS, CW



University of Pennsylvania

Human Resources / Employment Office Room 130 Franklin Building/16 3451 Walnut Street Philadelphia, PA 19104

Programmers/PAs/PLs/PMs

4th Generation Database

POLYGRAM, the worlds largest record company with US headquarters in midtown Manhattan is moving into 4th generation software.

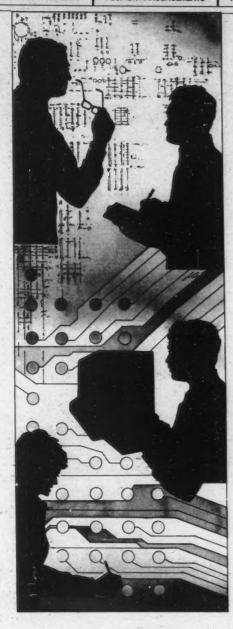
TODAY we are implementing our first 4th generation database using prototype and modeling techniques. TODAY we are building a team which will help us through an ambitious development plan for the future. TODAY we are laying the foundation for on-line interactive applications like inventory management, bill of material, distribution support, and management and financial reporting.

We need creative, quick-thinking, ambitious professionals with IBM mainframe (preferably 4341), on-line (preferably CiCS) and ADABAS-/Natural experience. A 4 year degree in math, engineering or computer science will be a plus.

If you like intense, pressured, creative work; if you are articulate and assertive; if you can think on your feet, and if you have between 2 and 10 years MIS experience please send your resume TODAY to MIS STAFFING, POLYGRAM RECORDS, 810 7TH AVENUE, NY, NY 10010

Polygram Records

in Equal Opportunity Employe



Sperry Engineering Where Team Effort Pays Off...by Design

With extensive new product development and expansion into additional markets, it's a time of challenge and opportunity at Sperry. Our Twin Cities-based Defense Systems Division is a major producer of a highly specialized array of hardware and software products.

During the last 18 months we've been awarded several major contracts and are currently finalists on a number of others. This has created outstanding professional opportunities for individuals with educational backgrounds in Computer Science, Math, Electronics or Electrical Engineering.

Here in Minneapolis/St. Paul, Sperry engineers work together in teams designing hardware and software products and developing new technologies. These refinements and new developments are then incorporated into Sperry computer products which are built at nearby manufacturing sites.

We currently have a number of key hardware/software systems engineering opportunities in the following areas:

- Relational DBMS Development: Position requires 2-10 years systems software development experience and direct involvement with performance analysis of DBMS storage systems, query processors and application interface. Additional experience with System R, INGRES, RIM, RDMS, or similar systems also required.
- Software Development: 1-8 years experience in host transferable software. Operating systems experience is desirable in UNIVAC Exec 8, IBM OS/VS2, DEC VAX/VHS, IBM VM/CMS. High level language compiler experience is desirable.
- Reliability Engineers: Engineers to evaluate the reliability of electronic system designs and develop improved techniques to insure good field performance of equipment/systems.
- System and Software Engineers: Experienced (5-15 years) Requirements Analysts, System Architects, Applications and Control System Software Designers, System and LAN Simulation Specialists, Failure Analysts, Human Workload Analysts, Man-Machine Interface Designers, Test Engineers and CBI Designers.
- Principal Logic Designers: Minimum of ten years experience in large scale Central Processing Unit (CPU) logic design. Familiar with pipelining microprogramming, multiprocessing, cache, and Built In Test Equipment (BITE). Knowledge of Military Standard Architecture desirable, such as UYK-7, UYK-20, UYK-43, UYK-44, AYK-14 or MIL-STD-1750A.
- Senior System Designers: Minimum of five years experience in system
 application of large scale digital military computers. Familiar with military
 peripheral equipments, multiprocessing, and standard interfaces such
 as MIL-STD-1397 and MIL-STD-1553. Experience with application of
 UYK-7 or UYK-43 is desirable.
- Logic Designers: Minimum of three years experience in logic design of CPU Input/Output Controllers and Interfaces, or Memory Systems.
 Familiar with computer architecture and TTL or CMOS circuit technologies. Experience in application of gate arrays desirable including Simulation and Generation of Test Vectors.
- Electrical Engineers: Minimum of three years experience in design of printed circuit layout and module interconnect. Familiar with Input/Output circuit design and parallel and serial interfaces including MIL-STD-1397 or MIL-STD-1553. Knowledge of EMI and EMP specifications such as MIL-STD-461 is desirable.

If you're a professional seeking the special rewards found in a team engineering environment, look to Sperry. You can meet with our representatives at the San Jose Tech Fair, August 27th and 28th or send a resume to: Professional Staffing, Sperry Corporation, Computer Systems, Defense Systems Division, CW, U1E20, P.O. Box 43525, St. Paul, MN 55164-0525. Sperry is an Equal Opportunity Employer. U.S. Citizenship Required. Principals Only.





Openings Available At Corporate And Choice U.S. Locations:

CHARLESTON, SC DETROIT, MI HOUSTON, TX KALAMAZOO, MI LOS ANGELES, CA LOUISVILLE, KY MINNEAPOLIS, MN PHILADELPHIA, PA PHOENIX, AZ SAN DIEGO, CA SAN FRANCISCO, CA TAMPA, FL WATERBURY, VT

PUERTO RICO

Data Processing Professionals

If your career is not growing as fast as it should.

ioin SCT

where our 40% + annual growth can give it the impetus it needs!

In a little more than 16 years, Systems & Computer Technology has become the undisputed leader in providing on-site software, systems development and computing resource management services to colleges, universities and local governments throughout the U.S.A. Our sustained 40% + annual growth requires the immediate hiring of DP professionals with broad technical background and a strong personal commitment, who can contribute to the continued success of our company. We need: company. We need:

- ACCOUNT MANAGERS
- SENIOR CONSULTANTS (Financial or Payroll Personnel)
- PROGRAMMERS/ANALYSTS
- TECHNICAL DIRECTORS

We provide a highly competitive salary and liberal fringe benefits plus the opportunity for continued professional and financial growth. Qualified individuals are invited to call Manager, Professional Recruiting

Toll Free, (800) 441-7247 Penna. Residents call collect (215) 647-5930

Or send resume with salary history, to: Manager, Professional Recruiting, Dept. CW-33A, SCT, Great Valley Corporate Center, 4 Country View Road, Malvern, PA 19355. An Equal Opportunity Employer, M/F.

SYSTEMS & COMPUTER TECHNOLOGY CORPORATION ...On The Grow!



Operation IMS The West Coast Project

Phase I: Locate Programmer/Analysts with extensive experience in either: a) IMS DB/DC, COBOL or PL/1, b) ACP/TPF teleprocessing monitor technology, c) Info Center/4th generation software such as NOMAD2 or FOCUS.

Phase II:

Relocate to project sites in either San Francisco, Santa Clara, Los Angeles, Portland or Seattle.

Phase III:

Promote on-going technical training to prepare consultants for new generations of systems development in banking, insurance, manufacturing, aerospace, corporate finance and telecommunications.

KNAUER's Operation IMS means salaries and management opportunities that set new standards for DP consulting worldwide. As part of our full-time permanent staff of senior professionals you'll work on a variety of projects. Our benefits include the 401k plan and extensive insurance coverage.

Call Marcie Podgur in San Francisco, (415) 434-4200 collect, to arrange an appointment. If you can't attend, send us your resume in confidence to explore our many consulting opportunities.



ELECTRONIC MAIL SYSTEMS ENGINEERS

OKI Systems Engineering is a Florida based division of a leading international firm, developing advanced telecommunica-tion software systems. We have leader positions in our new facilities in Kissimmee, Florida (Orlando area) for persons interested in and experienced in:

- Z-80 Assembler and "C" Languages
- Local Area Network Architectures
- SDLC/HDLC Terminal Link interfacing
- · CP/M, VAX-VMS, and UNIX Operating **Systems**

Responsibilities include management of detailed design and implementation of data communications architecture and software supporting attached devices. PACKET switching networking and advanced office automation features for an integrated data voice PBX.



EXPERIENCED
SYSTEMS
PROGRAMMERS,
ANALYSTS AND
PROGRAMMER
ANALYSTS FOR
SUNBELT LOCATIONS



Openings in a variety of areas and disciplines. (714) 891-UNIX* COMPUTER PROFESSIONALS UNLIMITED, agency

ATTN: IBM TRAINED C.E.'s

IBM TRAINED C.E.'s
HTS needs Customer engineers
with IBM training and a minimum
of 1 to 3 years experience in the
following locations: Chicago, Ft.
Wayne, Indiana, and surrounding
suburbs. Exceptional compensation, complete benefits package.
Send resume and salary requirements to:

ments to: Hartford Technical Services 355 Beinoris Drive Wood Dale, IL 60191 1-800-323-6355

OPERATION SHIFT MANAGER

First Data Resources, Inc., a growing leader in data processing, a pioneer in telecommunications systems, innovators in data delivery and explorers of leading edge technology, has an immediate opening for a talented professional.

The ideal applicant will have a minimum of 5 years including 2 or more years in a supervision management capacity. MVS/JESII, JCL and mul CPU's and good understanding of all facets of computer room management, scheduling, planning essential. An appropriate education, background and excellent interpersonal skills

We offer an excellent starting salary and complete benefits plus an outstanding career challenge. For consideration, please forward your resume including salary history, to. DAVE VONTZ.

1-800-228-9079



FIRST DATA RESOURCES, INC. 10805 Old Mill Road Omaha, NE 68154



SYSTEMS PROGRAMMER V

West Virginia Network for Educational Telecomputing has an immediate opening for a Systems Programmer V. WVNET is a consortium of 17 colleges and universities of WV. The host site is comprised of the following IBM hardware and software: IBM 3081/D - MVS SP 1.3.3, JES 2, CICS, ADABAS, DF/EF, CJSM, RMF, OMEGAMON, OMEGAMON/CICS, WYLBUR, ACF/V-TAM, ACF/NCP, NTO, ETC. AMDAHL V7A - VM/SP 3, SPIRES, RSCS/E, SMART, DIRMAINT, SIM3278, PROFS, DCF, ISPF, VMBACKUP, VMARCHIVE, ETC. This position requires a BS degree plus 1 year of systems programming experience. Send resume or apply by September 3, 1984 to Mrs. Ricki Dulin, Personnel Manager, WVNET, 837 Chestnut Ridge Road, Morgantown, WV 26505. Phone 304-293-5192. An Equal Opportunity Employer. portunity Employer.

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

California

MICRO SOFTWARE EXPERTS

\$38,000 - \$48,000

With more than 100 professionals in offices across the country, SEI is a major resource for high-technology EDP consulting support.

SEI/California offers opportunities to take part in the developof new micro-based products, at SEI clients and offices in Los Angeles and Silicon Valley.

Current projects include workstation development, system software porting/failoring/support, and selection/refinement/development/validation of major applications packages.

Qualifications

- Outstanding successful experience in large-scale, microbased software development
- Working knowledge of micro-based operating systems, compilers, communications, I/O drivers, LANs, graphics, and software products
- Experience with Unix, C, MS/DOS, and IBM-PC is of particular interest

SEI offers top salaries, an imaginative personalized benefits package, constant challenge, and unlimited opportunity for growth. For confidential consideration, send detailed resume and salary history to:

Russell Omey Regional Manager SEI Information Technology 5455 Wilshire Boulevard Los Angeles; California 90036

SEI information technology

THE BUSINESS OF TECHNOLOGY

- An Equal Opportunity Employer M/F -

"Unix is a trademark of AT&T Bell Laboratorie:
"MS/DOS is a trademark of Microsoft

Chicago

ONLINE APPLICATION DEVELOPERS

\$35,000 - \$42,000

With more than 100 professionals in offices across the country, SEI is a major resource for high-technology EDP consulting support.

SEI/Chicago offers you the opportunity to take part in new applications development for the mobile telephone industry and publications industry. These are major new systems: distributed, networked, online — some of the genuinely significant development projects of the 1980s.

Projects are now in full swing, but with room for a few more talented EDP professionals.

Qualifications:

- Substantial real-world development experience
- Familiarity with large-scale IBM environments and software: OS/MVS, VM/CMS, CICS, IMS, VSAM
- Working knowledge of Structured Analysis and Design
- FOCUS experience a plus

SEI offers top salaries, an imaginative personalized benefits package, constant challenge, and unlimited opportunity for growth. For confidential consideration, send detailed resume and salary history to:

Lonna Schroeder Regional Manager SEI Information Technology 450 East Ohio Street Chicago, Illinois 60611

SEI information technology

THE BUSINESS OF TECHNOLOGY

- An Equal Opportunity Employer MIF

New York State

APPLICATION DESIGNERS

\$34,000 - \$48,000

With more than 100 professionals in offices across the country, SEI is a major resource for high-technology EDP consulting support.

SEI/New York offers you the opportunity to design and develop essential systems in the fulfillment and publishing industry. These are not incidental systems, but the central systems through which our clients conduct their business. Major project sites include New York City, Putnam County, and the Virginia Tidewater area.

SEI has requirements for a range of professionals to design and construct these IBM mainframe applications systems.

Qualifications:

- Extensive design experience for large-scale applications.
- Familiarity with online IBM environments, particularly CICS/VS.
- Working knowledge of Structured Design, Programming, and Testing.
- Project management experience desirable.

SEI offers top salaries, an imaginative personalized benefits package, constant challenge, and unlimited opportunity for growth. For confidential consideration, send detailed resume and salary history to:

Gene Gessert Regional Manager SEI Information Technology 122 East 42nd Street, Suite 1700 New York, New York 10168

SEI information technology

THE BUSINESS OF TECHNOLOGY

- An Equal Opportunity Employer MIF

Phoenix

IBM INTERNALS EXPERT

\$49,000 - \$69,000

With more than 100 professionals in offices across the country, SEI is a major resource for high-technology EDP consulting support.

SEI/Phoenix offers you the opportunity to configure, generate, install, tune, and support major IBM operating systems software components in full-scale, state-of-the-art configurations. Work includes custom tailoring for high performance, high volume environments.

Current projects include work with MVS, MVS/XA, and leading edge telecommunications components.

Qualifications

- Outstanding IBM systems programming experience.
- Hands-on experience with MVS, MVS/XA, CICS/VS, IMS/VS.
- Understanding of the interaction between systems and applications, technology and users.
- Knowledge of VTAM, VCNA, NCP a plus.

SEI offers top salaries, an imaginative personalized benefits package, constant challenge, and unlimited opportunity for growth. For confidential consideration, send detailed resume and salary history to:

William Bartels Regional Manager SEI Information Technology 313 East Thomas Road Phoenix, Arizona 85012

SEI information technology

THE BUSINESS OF TECHNOLOGY

- An Equal Opportunity Employer MiF -

NEW ORLEANS—home of the 1984 World's Fair—is also the home of Middle South Services, Inc., the Service Company of the Middle South Utilities System. We offer challenging career opportunities with one of the South's largest Utilities.

ENVIRONMENT consists of IBM 3084, 3081, and 4341 supporting large scale IMS development projects, scientific and business applications.

PROJECT LEADERS

- Position involves Financial development efforts emphasizing strong background in project management. IMS DB/DC experience is a plus.
 Responsible for design and review of physical data bases, design in-house or outside packages. Strong IMS concept background with proven administrative abilities.

SYSTEMS PROGRAMMERS

- (IMS or CICS) Responsible for New Release Installation, Problem Resolutions and System Tuning, Experience in IMS DB/DC.
 Responsible for CICS Internals including TABLE GENS—SYSGENS, Performance/Tuning, MVS Dump Analysis and Problem Determination.

PLANNING ANALYST

Requires a background in H/S capabilities, Applications Development and Analysis, Equipment Evaluation and Computer Cost Studies.

SENIOR IMS SYSTEM DESIGN ANALYST

Experienced Systems Analyst needed to work on a large scale development project. Previous experience in IMS data base design and performance analysis along with application develop-ment experience. ADF exposure a plus. The selected individual will function as a design team

MIDDLE SOUTH offers an exceptional Relocation package including: Relocation Allowance (One Month's Salary)

Paid Moving Expenses
Paid House Hunting Trip
Mortgage Interest Differential plus Interim Living

We offer an excellent benefits Program and Compensation Package. For more information contact Joseph Hotard or Byron Heath:

1-800-231-4481 In Louisiana, call Collect (504) 569-4960 or send resume. P.O. Box 61000, New Orleans, LA 70161



EDP MANAGEMENT CONSULTANT

Our Information Systems Consulting Group in the Los Angeles office is seeking qualified candidates to meet our expanding practice. Consulting assignments include requirements analysis, developing information systems plans, hardware/software selection, data processing reviews, and computer system implementation and conversion planning. The first project will be performed on-site in Honolulu for one year. The qualified candidate should possess the following specific skills and experience:

- Minimum of a bachelor's of science in business administration, computer science or related field.
- Minimum of 2-5 years progressive experience in analysis, design and implementation of state-of-the-art business systems.
- Participation in both custom systems development and software package implementation projects.
- Exposure to several hardware environments including mainframe and medium to large mini-computer configurations.
- Understanding of structured systems development and data processing management techniques.
- Oral and written communication skills.

Please send resume and salary history in confidence to:



PROGRAMMERS HIGH DOLLAR CONTRACTS IN NYC

Long term. Generous Per Diem. Particular interest in the following skills:

HOGAN Software ACP

Call or send resumes to: Ray Sheerin (212) 239-4750

Vectron Systems Inc., One Penn Plaza, Ste. 1429, New York, NY 10119. An equal opportunity employ-

Vectron Systems Inc.

PROJECT COORDINATOR Game, Fish and Parks Department

Department

South Dakora is seeking a dala processing professional with a bachelora degree in computer science, business or closely related field and at least 5 years of system planning and all least 5 years of system planning and seeking the see

resume which includes this position title Social Security Number, postmarked no than August 31, 1984 to:

Bureau of Personnel Public Safety Building Pierre, SD 57501

DATA RESOURCE MGR

Extensive exp. in Data Admin. and DBMS. Proven capability to recruit & manage technical staff. Attractive benefits pkg. incl. full relocation. Reply in confidence with salary history to:

CW-B4045 Computerworld Box 880 Framingham, MA 01701

COMPUTER CONSULTANT

Needed to consult with fechnical support per-sonerish me development and design of spa-cores in the development and design of spa-personers of the space of the space of the DEM Nonstop If computer system by using knowledge of PATHWAY, INFORM and other TANDEM utilities. Provide technical support to the wire trained cepatrment for the CFTS or the wire trained reparation of the CFTS critical space of the computer of the computer of the critical space of the computer of the critical space of the computer of the computer of the critical space of the computer of the computer of the critical space of the computer of the computer of the critical space of the computer of the computer of the critical space of the critical space of the computer of the critical space of

COMPUTER

The Los Alamos National Laboratory has several chal-lenging career opportunities for Computer Scientists/ Engineers in the areas of computer networking.

Scope of Work

Design and develop network control and data com-munication software. Specific areas include network gateways, local area networks, high speed packet switching, terminal concentrators, secure communi-

Requirements

Demonstrated professional experience in computer networking or operating systems. These positions are for individuals who are able to work and communicate effectively in a team effort, require a minimum of supervision, and are highly motivated. B.S. degree in computer science or equivalent education and experience will meet minimum educational requirements.

Position Offers:

Competitive salaries and fringe benefits, including 24 days annual vacation; sick leave; paid holidays; medical, dental and retirement programs.

The Los Alamos National Laboratory is located in the mountains of northern New Mexico, at an elevation of 7400 feet. The living is uncrowded, casual, and poliution free. The sunny climate is superb; cool summers and mild winters. Los Alamos has an excellent school system and ample recreational opportunities. To apply, send resume, in confidence, to:

Tim Merrigan, DIV 84-DD C-5, MS B255 Los Alamos National Laboratory Los Alamos, New Mexico 87545 U.S. Citizenship Required.



ATTENTION SYSTEMS **PROGRAMMERS** MAKE YOURSELVES KNOWN

Our Client Companies Have Asked Us To Actively Search For Qualified Candidates For Their "State Of The Art" Data Centers. IF YOU ARE INTERESTED IN ADVANCING YOUR CAREER AND READY TO MAKE THE MOVE, CONTACT US ... WE NEED YOU!

Here is just a partial list of the many openings we are trying to fill:

Position	To
Capacity Planner, OS/MVS (FL, GA)	45K
SR Sys Prog. OS/MVS (FL, GA, NC)	40K
Sys Prog. DOS/VSE, CICS (FL)	40K
Sys Prog, JES2, per & tun (FL, GA, AL)	32K
Sys Prog, ACF/VTAM (FL)	37K
Tandem Prog, TAL (FL, GA)	35K
Series 1, DOS/VSE (FL)	35K
PROJECT MANAGERS	
OVOTERN AND VOTO	

OVER 300 SOUTHEAST OPENINGS CALL NOW!! (904) 725-0667 Or send Resume to:

Kelly Davidson/Susan Lankford (904) 725-0667

Advanced Recruiters

P.O. Box 19141 Jacksonville, FL 32245-9141

RESULTS

Whether you're buying, selling, swapping, hiring or looking.

you get results from

Computerworld classifieds. Maybe that's why Computerworld

gets more classified advertising than all the other computer publications put together!

Programmer/ **Analysts**

Be at the center of next generation computing...at NCR

NCR Engineering and Manufacturing—Columbia is forging ahead in microcomputer small business systems design and development. We conceived, developed and manufacture the UNIX*-based Tower 1632, a breakthrough in new-generation systems capability. The Tower's only seven inches wide, yet is packed with state-of-the-art technology including a Motoroia 68000 processor and a Mutibus peripheral interface, with industry-standard hardware components.

e part of our success story in one of the following areas of tvanced development. All positions require either a BSCS of

APPLICATIONS PROGRAMMERS-

To specify, evaluate and port industry standard applications packages. Requires solid experience and UNIX/C knowledge.

SYSTEM INTEGRATION AND TEST ANALYSTS--

To test and integrate UNIX systems and to isolate and repair SW modules. Requires UNIX/C knowledge and familiarity with source code control and SW test techniques.

PRODUCT SUPPORT ANALYSTS--

FIRMWARE DEVELOPERS--

To develop firmware for processor modules and device controllers. Requires M68000 assembler and C knowledge as well as experience with diagnostics. Familiarity with UNIX pre

Explore your excellent career prospects with the dynamic \$3.7 billion NCR Corporation. Send confidential resume with salary history, indicating position of interest, i.c Gordon Davidson, Personnel Resources, NCR Corporation, Dept. U56, 3325 Platt Springs Road, West Columbia, \$C 29169



Celebrating the future

An equal opportunity employer

*Trademark of AT&T Bell Laboratories

PROGRAM THE ULTIMATE CAREER.

At Sunbank in Orlando

Enter the aggressive stance and planned growth of Florida's most dynami banking organization. Enter the technical challenges and Sunbank Servic Corporation's state-of-the-are revinorment. List opportunities for advance ment because Sunbank is a wholly-owned subsidiary of Sun Bank, Inc., on of the fastest-growing bank holding companies in the Southeast with asset over \$31 billion. List 260+ banking offices throughout Florida linked by Branch Automation System, a highly sophisticated information Center, an one of the largest ATM networks in the nation.

Assign values to a competitive salary, generous benefits, assistance, encouragement to achieve and grow. If you can capita of the opportunities below, you can program an outstanding yourself with Sunbank.

CAPACITY and PERFORMANCE ANALYSTS

You should have 2 to 3 years of performance tuning experience in MVS or IMS, including running software monitors, and the ability to work with all levels of management. Experience in IMS/PARS, VTAM/PARS, and BEST/1 with a knowledge of IMS and VTAM is preferred.

wer the advantages of Florida living with unlimited recreational opposes and no state income tax. If you'd like to combine a programmir with our easy Orlando lifestyle, please sendyour resume in confiden unbank. Service Corporation, Technical Recruster, Dept. CW, 22 iee Row, Orlando, Fl. 32809.

An Equal Opportunity Employer M/F/H/V



At M/A-COM DCC, We're Looking Forward to



Because of the nature of the ecommunications industry, the innovations that made us a world leader have to be improved upon daily. And at M/A-COM DCC, they are. A part of M/A-COM, Inc., a Fortune 500 company, we're at the cutting edge in the industry, designing, developing, and manufacturing data and satellite communications products.

We look forward to the telecommunications future and the advancements that we will make. And we are currently seeking the professionals who will help us make them. We have immediate career opportunities available for the following technical professionals:

SENIOR SOFTWARE ENGINEERS

Two areas of application are available for talented software professionals. In one area, you will design and develop software for digital communications systems. You will work on advanced Intel microprocessors, and have respon-sibility for design and imple-mentation for the control of speech interpolation equipment. You must have a BS degree in Computer Science with at least 4 years of experience in microprocessor software development using high-

Duties for the other position will include leading a software effort for ongoing maintenance, support, and enhancement for a large-scale, in-place network. This position requires 2-5 years experience with Data General 16 bit minicomputers, RDOS operating system, DCU coding, or

SECTION MANAGERS

We are seeking two Section Managers to join us. Responsibilities for the first position include providing technical and administrative leadership for software support on various data communications projects. The ideal candidate will have a BS degree and 6-10 years experience on mini and microcomputers, preferably DEC, VAX 11/780, and Intel 8086/80186/ 80286.

Another position is available for a manager to direct efforts and work on maintenance and enhancement for all software operations and product support lines. A BS in product support lines. A BS in Computer Science or related degree and at least 5 years experience in real-time system development and support is required. Experience with Intel 8086, PLM, and Pascal helpful.



M/A-COM DCC offers top salaries, excellent company-paid benefits, unlimited state-of-the-art challenges and an exceptional working environment. Additionally, our location is as attractive as our opportunities. We're positioned just outside of our nation's capital where you can be near mountain ski resorts and Atlantic Ocean beaches. You can also enjoy an evening at the Kennedy Center or visit all the major cities on the East Coast . . . all just minutes away.

The future of telecommunications begins at M/A-COM DCC. Yours can too. Look into one of our challenging career opportunities by sending your resume and salary history in complete confidence to:

SUSAN MORALES Technical Recruiter M/A-COM DCC, Inc. 11717 Exploration Lane Germantown, MD 20874

An equal opportunity employer.



DATA BASE ANALYST

ANALTS I High tech mfr. seeks Sr. IMS DB/DC Analyst. Min. 7 yrs. exp. as a DB Analyst in a med. or ige. scale IBM installation. Act as proj. mgr. for the DBA on major projs. \$39,000.

ROBERT HELF
OF PROVIDENCE, INC.

900 Turks Head Building Providence, Ri 02903 (401) 274-8700 Personnei Consultants

ationwide panning the full ing and Software ing Field



(315) 451-4220

Visiting San Francisco?

Let us know when you are riving and we may arrange that you stay forever! ou are an experienced Data Processing slessional with skills in Large Systems or is. Data Base or On-Line Systems, sider a move to the beautiful San

हुतवाद्यह राज्याच

Incorporated Agency
One Market Plaza, Speer Tower, Suite #2814A
San Francisco, CA 94185

(415) 777-3907

EXPERIENCED SYSTEMS DEVELOPMENT PROFESSIONALS

DOMINION BANKSHARES CORPORATION, a \$4 billion multibank holding company with over 150 offices throughout Virginia, is seeking experienced Systems Development Professionals to staff our growing needs in Roanoke, VA.

Our Computer Center utilizes large scale IBM mainframes and a statewide communications network in support of our bank and bank related offices.

If you are the type of person who wants to excel in your profession, and at the same time live in a beautiful part of the country, please compare your experience to the positions listed below:

APPLICATIONS PROGRAMMER

The successful candidate for this position will have 3-5 years of programming experience in a banking environment and at least 1, year of experience on a loan system. A Bachelor's Degree and Kranzley experience is a plus.

SYSTEMS ANALYST (CIS)

A qualified candidate for this position has experience, using a formal project life cycle methodology, in problem definition, external and internal system design, functional supervision of programmers, system testing and implementation. Project assignments will involve enhancement and maintenance of an on-line customer information system (CIS).

PROGRAMMER/ PROGRAMMER ANALYST

Our Systems Development Division is seeking experienced Programmer /Programmer Analysts. These positions require 3-5 years programming experience and 2 years COBOL experience. Large IBM mainframe experience and a Bachelor's Degree are a plus.

DOMINION BANKSHARES CORPORATION offers a wide variety of benefits including medical, dental and life insurance, a pension plan, a savings plan, a stock purchase plan, relocation assistance and competitive, performance-based

For confidential consideration call: John Sanders at (703) 563-7952 (COLLECT) or send your resume with a cover letter indicating your salary requirements and the position you're interested in to: John R. Sanders, Jr., (CW), Professional & Technical Recruiter, DOMINION BANKSHARES CORPORATION, P.O. Box 13327, Roanoke, VA 24040.

An Equal Opportunity Employer M/F/H



DOMINION BANKSHARES

SYSTEMS (\$32K - \$39K)

(\$32K - \$39K)

Carnt Courty Public Wally Telentic is esseiving an experience of Systems Programmer to evaluate, metal, and maintain software including operating system, interactive and data base; audit performance of data processing activities and develop methods of improving performance, evaluate and recommend selection of gram for data processing personnel. The position requires a SS in computer selection and 3 years of systems programming experience and training. A knowledge of IBM 979 architections in exeded they said in road communications and in writing standards and procedures manuals. Also a knowledge of fortrain and Real-Time applications a plus.

Cur utility is located in Central Washington.

Our utility is located in Central Washington which has a relatively mild year-round climate and excellent outdoor recreation opportunities. We offer an excellent fringe benefit package including basis and major medical, dental, lite, and Washington State Retirement.

mit resume to Grant County PUD, P.O. 878, Ephrata, WA 98823. An Equal Op-

SYSTEMS PROGRAMMER

EASTERN KENTUCKY

SPONSIBILITIES-Provide technical assis-te relating to: operating system; communi-ors system; application development and rations toots; complex lie elesign; and pro-ming methods. Share in administration of tions related to: systems software; tech-i standards for optimization and forecast-of resource utilization. Assist with conver-forecource utilization.

QUALIFICATIONS-Candidate should have B.S. or M.S. in appropriate disciplines, techni-cal courses relieted to duties described herein and a minimum of 5 years experience in Sys-tems Programming and/or related areas. Cur-rolls, 18M 4341/M12 system with OS/VS1 OGS, 814M, TOTAL, ROSCOE.

Position available immediately. Forwar sume and references to A.D. Aligier, Adr trative Systems, Eastern Kentucky Unive Perkins 306, Richmond, Ky. 40475, by A. 27. An Equal Opportunity, Affirmative A.

MGR. TECH. SVCS.

erns software with good track re-cord and degree to manage large-scale IBM MVS-XA installation. To \$50K.

2720 Stemmons Frwy., 1207F Jallas, TX 75207, (214) 637-630 DATA PROCESSING CAREERS

S.W. FLORIDA

COURT SYSTEMS MANAGER

Court Systems design, ANS-CO-BOL expertise, and strong people skills are required, preferably with DEC VAX-11/780 background. Competitive salary, benefits, and opportunity to enjoy S.W. Florida litestyle. Send resume ASAP to: D.P. Director, Collier Countty Courthouse, P.O. Box 413020, Naples, FL 33941-3020.

MARKETING VP/MANAGER/ SALESMEN NEEDED

We offer on-site and public courses in CICS, IDMS, IMS, VSAM, VTAM, etc.

We also have a pool of experienced consultants for per diem contracts. We are looking for experienced marketing people with industrial contacts. We offer fixed salary, commission and profit sharing. Please call Mike at (212) 777-5040 or write:

10 East 21st Stre New York, NY 10010

COMPUTER SCIENCE **TEACHING POSITION**

State supported Liberal Arts college requires masters degree in computer science. gree in computer science. Send resume with transcripts

Personnel Office University of Science and Arts of Oklahoma Chickasha, OK 73108 (405) 224-3140

MCAUTO

IBM SYSTEMS PROGRAMMERS

MCAUTO has immediate need for IBM Systems Programmers with Bachelors Degree. Minimum two years JES/MVS (XA or 370) experi-ence; would support complex of IBM 3081/3084 processors:

· SYSTEM PERFORMANCE ANALYSIS

Individual with working knowledge of MVS internals, proficient in use of SAS and BAL, familiar with use of SMF, RMF, MICS, OMEGAMON, DEXAN, GTF. Experience in performance/capacity, analysis, virtual memory and DASD performance manage-

MVS OPERATING SYSTEM SUPPORT

Individual with current experience in maintaining MVS/370 or MVS/XA, able to perform I/O sysgens, full sysgens, program product installation. Proficient in use of SMP/SMPE, IOCP, BAL, TSO, VM/CMS.

· JES3 SOFTWARE SUPPORT

Individual with current experience in maintaining JES3 pre-ferred. JES2 experience considered. Proficient in use of BAL. TSO, VM/CMS.

se call 714/952-5575 or send resume t

MCAUTO

Department 051-2W 5701 Katella Avenue Cypress, California 90630

McDonnell Douglas Automation Company

Setting the standard in data processing

An Equal Opportunity Employer M/F

System Developers 800-231-5920

Fees are paid by

Scientific Placement, Inc.

DO YOU LACK PROFESSIONALS?

Like all industries the computer industry is rapidly growing and with this growth comes change. We know that in order for your business to keep up with the times you must have qualified people in key places. Our studies show that Computerworld reaches people in every aspect of the computer industry. With over 121,000+paid readership Computerworld could be reaching the qualified personnel you're looking for.Our circulation ranges from Consultants, Engineers, Managers, Systems Analysts, Controllers, and DP/MIS professionals.

Computerworld is doing everything possible to ease the problems related to advertising. We will accept camera ready copy, typeset copy mailed into us, or accept simple ads over the telephone. Our current agate line rate is \$9.15, per column inch we are \$128.10. Our minimum ad size is 1 column x 2" and costs \$256.20. For more information call or write:

COMPUTERWORLD

Classified Advertising 375 Cochituate Road Box 880 Framingham, MA 01701

(617) 879-0700

DIRECTOR OF THE OFFICE OF ACADEMIC COMPUTING AND BIOSTATISTICS THE UNIVERSITY OF TEXAS MEDICAL BRANCH AT GALVESTON

AI GALVESTON

The University of Texas Medical Branch (UTMB) is seeking qualified candidates for the position of Director. UTMB is the oldest health science center in the University of Texas System. Its academic schools include Medicine, Nursing, Allier Health Sciences, and the Gradulate School of Blomedical Sciences. UTMB services are programs are rapidly expending, and its academic computing support capabilities must be improved and enlarged to facilitate this academic growth. The Office of Academic Computing and Biostatistics is part of the Office of the New York of the Computing and Biostatistics is part of the Office of the management of an established office charged with the responsibility for providing an effective computing and biostatistical environment in support of the academic programs of a major health science center.

The suppossibility diagnostical text diagnostics and forther programs of a major health science center.

programs of a major health science center. The successful candidate will demonstrate effectiveness in the areas of manag-ing a large, diverse computing operation, working effectively with biomedical in-vestigators, building a strong collaboration with the administrative computing organization, providing a comprehensive educational program for faculty users, and strategic planning. Candidates should ideally have an earned doctorate in a computer-related area and threes passes of successful administrative experience at the Director or Asso-ciate Director level in an academic computing operation. Significant experience as an administrator of academic computing in a health science center will replace the doctorate requirement. Please send a letter and current curriculum vitae by September 28, 1984 to: Charles W. Tandy

Charles W. Tandy
Assistant Vice President for
Planning and Public Affaira
Assistant Dean for Administration
Suite 528, Administration Bidg.
The University of Texas Medical Branch
Galveston, Texas 77550 The University of Texas Medical Branch is an Equal Opportunity Affirmative Action Employer

SOFTWARE ENGINEERS UNIX*, C, PDP11, M68000

Grow With A Growing Company



Computer Consoles, Inc.
designs, develops, manufactures,
markets, and services a variety of minicomputerbased **fault-tolerant** information systems. Headquartered
in Rochester, New York, we have all the cultural and
educational advantages of a large metropolitan area as well
as the ambience and scenic beauty of a small, relaxed town.

CCI currently has immediate opportunities for

Group Leaders/ Senior Software Engineers

You'll be responsible for the design and implementation of data base applications and utilities, or fault-tolerant operating system development including development of a multiprocessor UNIX-compatible transaction processing system. We prefer a technical degree plus a minimum of 4 years' ex-perience. Knowledge of C, UNIX, and data structures plus experience with data bases in a minicromputer Real Time or on-line environment and/or OS internals are also desired. We are willing to train otherwise qualified candidates with high level languages. U.S. citizenship or permanent residence is excellent.

*UNIX is a trademark of Bell Laboratories

We offer opportunities for growth plus attractive compensation and benefits including relocation. For immediate confidential consideration, please forward your resume including salary history to:

S. C. Hoskins Computer Consoles, Inc. 97 Humboldt Street Rochester, New York 14609

Equal Opportunity Employer M/F/H/

SOFTWARE DEVELOPERS

Goal Systems is a profitable and growing system software development and marketing firm located in Columbus, Ohio. We maintain continuous job openings for exceptionally creative and experienced people to add major extensions to our existing software products and to design new products.

Minimum qualifications include:

- · Expertise in IBM/370 Assemble Experise in Ibm/370' Assembler
 Internals level knowledge of some major system such as: MVS, VM, CICS, VTAM, VSE, compilers, security systems, graphics, networking, etc.
 Ability to define, evaluate, implement, and test system designs, strategies, and alternatives
 Design and development experience on some ma system

We offer competitive starting salaries, outstanding company-funded profit sharing and benefit programs, and the opportunity for software developers to participate in the success of their products.

To take advantage of this unique opportunity, please send resume, including salary history, or call:

Kathleen Cauley, Human Resources Mgr

GOAL SYSTEMS INTERNATIONAL 5455 N. High Street • Columbus, Ohio 43214 1-800-848-4640



Software Solutions An Equal Opportunity Employer

To all those who don't have a two digit badge number at

Just think where you'd be now if you had been with any one of these companies when they started.

Opportunities that great come just once in a career. If you are a software professional, it's time to grab your chance now.

Master Software is an exciting, new company with a unique product line—the world's first fully reusable software. Even at this early date Master Software has an impressive client list of Fortune 500 companies.

you want in on the ground floor, send your resume to our personnel office or call 617-924-0052.

You could be joining a small group of professionals with some very big plans.

Midwest Regional Sales Manager

Responsible for penetrating the marketplace with a family of state-of-the-art application development tools for data processing or MIS groups in large retail, financial, manulacturing, and governmental organizations. Ideal candidates will have over 10 years of successful sales and sales management experience selling to large IBM or IBM compatible organizations in the Fortune 1000. Must have experience training, motivating, and directing a successful sales and sales support organization.

Sales Representatives—West, Midwest, and East Regions

To sell state-of-the-art application development tools to MIS executives in the data processing industry. Ideal candidates will have a sales or technical background in large IBM or IBM compatible data processing environments, have three plus years of successful sales experience and be capable of selling to data processing professionals at all levels.

Customer Service Representatives—West, Midwest, and East Regions

Work with customers at all levels to select projects, establish goals, and create action plans for implementing the use of state-of-the-art application developement tools by application developers in large IBM or IBM compatible MIS groups. Install software products at customer sites and train customers in product use. Can involve 50% national and international travel.

Must have product and written communications and written communications.

Must have good oral and written communica Must have good oral and written communica-tion skills; thorough knowledge of COBOL, TSO/SPF and OS/MVS JCL including IBM utili-ties; a working knowledge of IMS, DB/DC CICS, and VSAM: exposure to CMS, ROSCOF, PANVALET, LIBRARIAN, and data dictionaries; and three plus years experience in data processing. Project management experience is a plus.

Software Developers

Design, code, test, and document state-of-the-Design. code: test, and obcument state-or many art programmer productivity software products. 3-5 years in data processing. A minimum of 1 year as a systems programmer or software product developer. A thorough knowledge of ASSEMBLER. COBOL, VSAM, IMS DB/DC or CICS, OS/MVS, TSO, SPF. A knowledge of PANVALET or LIBRARIAN and data dictionaries is a plus.

Master Software

Master Software. Inc. 42 Pleasant Street, Watertown, MA 02172

MFG. SYS.

This prestigious nat. mfr. seeks polished analyst for new mfg. apps. develop. projs. Diverse tech. environ. includes IBM OS mainframes + minī* & PC's. If you're on a fast-track, this exciting oppty. will enhance your tech & apps. exp. \$38,000.

FIN'L MODELING CONS.

Superbly managed fin'l. svcs. Superbly managed firl: svcs. os. seeks aggressive analyst to develop firl: models. State-of-the-art technology incl. IBM OS/M/VS/TSO mainframes, Sysem W, IBM PCS, LCTUS 1-2-3. Must have IFPS, EMPIRE, EX-PRESS or any 4th gen. language. Hvy. Interface w/portfolio mgrs. & security analysts. \$36,000.

ROBERT HALF

100 Summer Street Boston, MA 02110 (617) 423-1200 Personnel Consultan

Programming Systems Analyst

For a growing, committed R&D effort in support of a nation-wide telecommunications base. You'll work with our NYCde telecommunications base. You'll work with our NYC-ased team to develop innovative software applications and

If you can offer a degree, working knowledge of Assembly and "C" programming languages using DEC-VAX/VMS hardware, let's discuss your potential.

Rewards include a state-of-the-art environment characterized by creativity and freedom of expression; excellent salary and a comprehensive benefits package. Send resume in confi-

CW-B4044 Computerworld, Box 880 Framingham, MA 01701

An equal opportunity employer

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS



OVERSEAS

udi Arabian Airlines, national flag carrier of the Kingdom of Saudi Arabia, is seeking qualified personnel for the following

SUPERVISOR RELIABILITY PROGRAMS Monthly Salary Range \$2543-3949 Tax Free* Plus Free Housing

DUTIES

Liaise with users. Develop and maintain programs for aircraft reliability, fleet statistics and computerized engine testing and maintenance. Collect statistics on component removals, target and alert exceedances, implement recommended changes in maintenance programs and monitor improvements as a result of such changes

SENIOR PROGRAMMER Monthly Salary Range \$2543-3949 Tax Free* **Plus Free Housing**

To develop and maintain computer programs for aircraft reliability and fleet statistics.

REQUIREMENTS

(For Both Positions)

Degree in computer related field and 3 years in design and development of real-time software system for engineering applications using Fortran and Assembler on mini computers.

Experience on HP-1000 with RTE 6/VM operating system and HP-3000 with MPE operating system and IMAGE/DBMS-3000 will be preferred.

BENEFITS

Free furnished air-conditioned housing and utilities . Paid medical and group life insurance • 30 day vacation-travel time to and from domicile • Free or reduced rates on Saudia and other airlines

Retirement program (social insurance after 15 years service)

Additional household shipment from domicile to Saudi Arabia and back . K-9 schooling for children — out of Kingdom financial assistance for other grades • Annual service increase and eligibility for yearly merit bonus based on per-

*Tax free status subject to normal qualifications. The indicated salaries have been converted from Saudi Riyals to U.S. dollars at the current rates of exchange, which are subject to fluctuation. Positions are offered on a two-year (renewable) contract.

Send resume to:

SAUDI ARABIAN AIRLINES Administrative Recruiter, Dept. 2R-P 2420 Pershing Road, Suite 333 Kansas City, Mo. 64108



MATIONAL BUREAU OF STANDARDS INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY OPPORTUNITIES FOR CHALLENGING POSITIONS IN COMPUTER NETWORKING

COMPUTER SCIENTISTS, ANALYSTS, PROGRAMMERS, AI Experts, Compand Statisticians needed for the following Programs:

Protocol Design Program - to design and specify network protocols in conjuction with Government, industry, and national and international standards bodies.

Protocol Correctness Laboratory - to develop test procedures, protocol implement and conduct tests with Government and industry.

Protocol Performance Laboratory - to design and test improved protocol algorithms to enhance performance of emerging international standards.

Network & Protocol Measurement Laboratory - to develop protocol and net ment methods used in instrumentation and modeling.

Protocol Methodology Program - to automate the design, specification, impletesting, and analysis of network protocols.

Special Network Projects - to research loosely coupled systems, network topology, network ergonomics.

thitecture Program - to research and design network management and opera-is: protocols for broadcast, multi-cast, multi-homed, and multi-media systems onnectionless and connection-oriented services.

Desirable experiences include work in computer/communications, computer prog artificial intelligence, compiler optimization, and technical committee work. An unde degree which consisted of 30 semisetel hours in maliferantics, statistics and com three (3) years of experience in the computer science field. Positions are available MS, and PhD. is an computer science or related fellow.

Positions range from \$30,549 to \$65,642 depending upon qualifications and experience and offer excellent career benefits and professional growth opportunities. Please send your Per-

U.S. Department of Commerce National Bureau of Standards ATTN: Ms. Vicky Southers (Code: CW1115) Administration Building, Room A-123 Gaithersburg, MD 20899

The National Bureau of Standards is located in modern facilities in Gaithersburg, Maryland and is an Equal Employment/Affirmative Action Employer. U.S. Citizenship is required.

SYSTEMS ANALYST

SYSTEMS ANALYST

The Administrative Computing Center at the University of Vermont its seeking a Systems Analyst with a Bachetor's General Application of the Computing Systems Analyst Experience, as a Systems Analyst Experience in CoBOL, IBM/DOS and online systems are required. Applicants with experience in higher education applications or COBOL, IBM/DOS and online systems are required. Applicants with experience in higher education applications or DOBMS are preferred. The candidate hered will be involved in the development of the Computing Administrative Computing, 238 Waterman Building, Burlington, VT 05405.

An Affirmative Action/

An Affirmative Action/ Equal Opportunity Employer

MIS DIRECTOR

select, install and no ology interests you im of 5 years DP thin the health care our resume and sa

Mercy Hospital 144 State Street Portland, ME 04101

SYSTEMS SOFTWARE

PHOGSHAMMEH
JOB #050878
ate CDC NOS Cray Station into a multitier network, maintain PDP-11 commuris software, maintain other data comrations software, other data
unications duties as arranged. Must
superisince with the internals of the NOS
station, and with PDP-11 computers in a
re communications environment. Must computers in a trong technical proficiency with NOS d RT-11. A BA/BS' in computer sci-related field and 2 years are scillors or computer scinoo or related field and 2 years expensive applications or operating systems program applications or operating systems programming required. Salary \$26,000 to \$39,588/yr. Feguivalent or additional experience may be substituted for a degree. Excellent fringe benefit package including tutton-free coursework.

free coursework.
Apply: University of Minnesota.
Minnespolis Campus Personnel,
-80 Morrill Hall, 100 Church St SE,
Minnespolis, KN 55455
UNIVERSITY OF MINNESOTA
ual opportunity employer and educator

MANAGER INFORMATION SYSTEMS

A challenging career opportunity at this 303 bed regional medical center located in a four season Great Liste resort rese. Application areas include all major framework and a medical systems activities. Responsibilities include all major a staff of approximation to a staff of a staff of approximation and a staff of a staff of approximation and a staff of a staff

Ms. Pat Webb Munson Medical Center 6th and Elmwood Traverse City, Michigan 49684

An Equal Opportunity Employe

SYSTEMS ANALYST

Min. 4 yrs. design/install of on-line IMS or CICS based projs. qualifies for CT corp. expanding distributed pro-cessing and fin1. svcs. div. Full reloc. Salary to \$34,000.

ROBERT MALF OF HARTFORD, INC.

111 Pearl Street Hartford, CT 06103 (203) 278-7170 Personnel Consultant

PROGRAMMER ANALYST

Ohio Wesleyan University has 2 posi-tions open for programmer analysts. Applicants should have 1-3 years of ex-perience in writing batch and CICS ap-plication programs in COBOL under DOS/VSE. Competitive salary with ex-cellent finige benefits being offered. Bachelor's degree required, university of the competition of the competition of the competition of the competition of the competition. Send resume, along with salary history, for

Personnel Department Phio Wesleyan Universit Delaware, OH 43015

SYSTEMS PROGRAMMERS (3)

Data Base/Data Communications

Mayo Clinic has openings for 3 Systems Programmers. These positions require 1-4 years of experience in a large scale IBM environment (Mayo has multiple 3033's). These systems programmers will participate in internals program development and should have a working knowledge of IBM assembly language, VM, MVS, TSO, and ISPF. Preference will be given to persons with a degree in computer science.

Mayo Clinic with 800 staff physicians, 800 physicians in residency training program, 700 students and other allied health educational programs, and 5500 paramedical personnel provides an exciting environment for the professional in these positions. Mayo also provides an attractive compensation package including an outstanding personal security and benefits program.

Mayo Clinic is located in a unique community of 60,000 persons, 80 miles south of Minneapolis/St. Paul via 4 lane freeway.

Interested and qualified candidates should send a resume and other pertinent material to:



A.W. Bigbee Personnel Sec MAYO CLINIC el Section 200 1st Street S.W. Rochester, Minnesota 55905

Principals Only
We Are An Equal Opportunity Employe

SENIOR SYSTEMS PROGRAMMER

WVNET is the computer network of seventeen colleges and universities of West Virginia. The computers located at the central site are a VAX Cluster of four 11/780's, a PDP-11/44, an IBM 3081/D, an AMDAHL 11/780's, a PDP-11/44, an IBM 3081/D, an AMDAHL V7/A, and a UNIVAC 1100/80. PDP-11/44's and VAX's are located at the schools. WVNET is seeking a Senior Systems Programmer to assist in supporting the VAX Cluster and RSTS/E on the PDP's. This position requires a Bachelor's degree and two years of DEC systems programming experience preferably with VAX/VMS and RSTS/E. Experience with DEC-to-IBM networking and DECnet is desirable. Salary: low 30's plus excellent benefits. Apply by September 3, 1984, to: Mrs. Ricki Dulin, Personnel Manager, WVNET, 837 Chestnut Ridge Road, Morgantown, WV 26505. Phone (304) 293-5192. AN EQUAL OPPORTUNITY EMPLOYER.

COMPUTERWORLD

You want your business to keep moving ahead, right?

Then you need quick, time-saving solutions to your personnel and equipment problems. Classified advertising in the #1 trade publication for the computer industry is the obvious way to get them...

...Classified Advertising in COMPUTERWORLD.

Our classifications include Position Announcements, Buy Sell Swap, Software for Sale, Time & Services, Business Opportunities, Real Estate and the Bulletin Board (the ideal, low-cost way to sell pieces of computer equipment).

If you are looking to hire computer professionals or to buy or sell equipment, contact us at 1-800-343-6474 or, in Massachusetts, call 617-879-0700. Our mailing address is COMPUTERWORLD, 375 Cochituate Road, Box 880, Framingham, MA 01701.

It's about the biggest step forward you can take toward solving your business problems.

Move ahead with COMPUTERWORLD.



Get in with a company going places.

At AP Telecomputing Corporation, our track record speaks for itself. With a 300% growth rate in 1983 and a projected 200% increase in 1984, the opportunities for career advancement in this totally DP-oriented organization are significant for people looking to stretch their talents.

We have major commitments to the continued develop-ment of proprietary software for use in both manufacturing and Cable TV markets. We are therefore seeking the right career-minded DP professionals to join our dynamic team.

EDP GENERALISTS: 10-15 years experience with strong management background in IBM technology, COBOL programing and applications development, application installations-evaluation & improvement, development & project enhancements.

PROJECT MANAGERS: 3-5 years heavy experience as Pro-ject, Systems or Programming Manager with strong IBM Main-frame exposure.

TELECOMMUNICATIONS SPECIALISTS: Particularly strong and successful experience in SNA/SDLC, VTAM, BTAM, Network Modeling, Packet Switching and Digital Data Services. (Voice networking a plus).

HARDWARE SPECIALISTS: Heavy experience in hardware configuration, optimum channel utilization, configurations, controls and IBM performance tuning.

PROGRAMMER/PROGRAMMER ANALYSTS: (IBM-PC or Wang-VSJ with 3-5 years experience in applications development using COBOL with IBM-PC or Wang-VS.

SOFTWARE APPLICATIONS INSTALLERS: Software installation experience with medium/small systems (IBM-PC-XT an im-

With an ever-growing prestigious roster of clients throughout the U.S., Canada, Europe and South America, we are able to offer excellent salaries and benefits.

To arrange a local interview, please call John DaGrosa or George Swanson, (305) 832-3799 or send your resume with salary history to: AP TELECOMPUTING CORPORATION, P.O. 80x 2091, West Palm Beach, FL 33402. Equal Opportunity Employer, m/f.

AP TELECOMPUTING CORPORATION

ELECTRONICS and COMPUTER SYSTEMS ENGINEERING

As a basic research laboratory for the nation's energy and defense programs, Los Alamos National Laboratory develops unique state-of-the-art real-time computer systems and remains at the front edge in high-tech computer technology. Our Computer Scientists and Electronic Engineers are developing some of the largest and most sophisticated control and data acquisition undertaken. We are designing and developing advanced software systems that are user friendly and reside in unique real-time operating systems. Our Electronics and Computer Systems singineering Group is looking Our Electronics and Computer Systems singineering Group is looking out the computer security of the systems of the sys

- levelopment engineers to work on:

 Advanced concepts in computer security technology with an emphasis on local area networks, operating system enhancements, communications, word processing, and architecture development.

 State-of-the-art data acquisition and control development which involves real-time systems and special purpose hardware, operating system development, data base system design and development, hardware/software design for distributed systems, graphic machine interface development, high-level anguage support and the system design and systems of the system design and systems of the sys

These positions require a Ph.D/M.S./B.S. and significant experience in hardware/software design and development.

We offer competitive salaries and fringe benefits, including 24 days annual vacation; 18 days annual sick leave; 11 paid holidays; medical, dental, and retirement programs.

The Los Alamos National Laboratory is located in the mountains of northern New Mexico, 30 milles northwestod Santa Pe, at an elevation of 7400 feet. The living is uncrowded, casual, and poliution free. The sunny climate is superb; cool summers and mild whiters. Los Alamos has an excellent school system and ample recreational opportunities. of 7 atous sunny climate is supersus sunny sun

Los Alamos National Laborator, Los Alamos, New Mexico 87545 U.S. Citizenship required



Data Processing

SYSTEMS ANALYSTS

PROJECT LEADERS

SENIOR SYSTEMS **PROGRAMMERS**

work with an **Industry Leader!**

If your analytical ability and expertise in large-scale business applications has surpassed the challenge of your present position, this opening with exceptional opportunity for advancement into management should interest you!

Mutual of Omaha Provides:

- The prestige in working in Omaha, Nebraska, a clean, progressive, me-dium sized city with the world's largest individual health insurance
- State-of-the-art hardware (IBM 3084Q; 3081K, 3033AP, 3033UP)
- Structured systems development in a state-of-the-art software environ-ment (IMS, CICS, COBOL, BAL, TSO/ISPF, ACF/VTAM, VM/CMS, MVS/XA)
- · Well defined career progression program in a rapidly growing divisionover 750 Data Processing professionals.
- Extensive in-house training-we keep you abreast of the latest developments in hardware and software.
- · Competitive, performance-oriented salary and outstanding benefits.

If you have proven skills on large-scale business applications utilizing IMS and a minimum of Four years of design and programming behind you, we would like to talk to you about an outstanding opportunity with a leader in the insurance industry.

Send your resume in strictest confidence, outlining your experience and salary requirements, to Don Kingsbury at the address below:



Mutual of Omaha Insurance Company Mutual of Omaha Plaza • Omaha, Nebraska 68175

Equal Opportunity Employer M/F

MANAGER OFFICE SYSTEMS NETWORK

: August 22, 19



RPI RENSSELAER POLYTECHNIC INSTITUTE

Rensselaer Polytechnic Institute has the following opening in its Center for Interactive Computer Graphics:

PROGRAMMER

Applications programming in support of research in the finite elements modeling area. Programming tasks range from interactive graphic user interfaces through higher level numerical analysis routines. Must be proficient in the standard application computing language (FORTRAN, Pt-1, PASCAL, and possibly "C") and have a working knowledge of interactive graphics programming techniques. Some background in numerical analysis and computational geometry required. A Bachelor's degree in Engineering or Computer Science and 1 year of programming experience or a Master's degree.

Please send cover letter and resume to: Employment Manager, Rensselaer Polytechnic Institute, 110 8th Street, Troy, NY 12181.

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

DERATIONS

We are a dynamic, multi-plant manufacturing operation with an excellent opportunity for an Operations Analyst to assist in the histaliation of our new computer at our Corporate Headquarters located in Oak Brook, Illinois, Reporting to the Operations Manager, the individual we seek will need 2-3 years experience in PRIMOS, PRIMENET. and INFORMATION.

Qualified individual will be responsible for our 2nd shift operation (3:30 PM to 11:30 PM) after systems implementation. Further duties will include evaluation of field distribution for a four-computer network, implementation and review of all systems software revisions and the backup of Corporate data files.

We offer a highly competitive salary and full benefits portfolio with a unique opportunity to fully utilize your expertise in a new Corporate setting.

For prompt consideration, send a resume including sal-

CW-B4042

Computerworld Box 880 Framingham, MA 01701

ary history and requirements to

SYSTEMS PROGRAMMING **OPPORTUNITIES**

As one of the largest and most diversified ship-builders in the world, we at Newport News are implementing the most advanced computer technologies available. To keep us at the forefront of the most modern technologies, we now have openings for experienced systems personnel in our Newport News, Virginia

COMMUNICATIONS ANALYST

3–5 years experience with ACF/WTAM and NCP in an MVS environment. Proficiency with WTAM and NCP traces and dumps and with MVS JCL required. Responsibilities include generating and monitoring a multi-host ACF/VTAM network. Also, will evaluate communications requirements and recommend configurations to satisfy these requirements TSO and ISPF experience highly desirable.

SYSTEMS SUPPORT ANALYST

3-5 years experience with MVS/SP and profi-ciency with product installations, SMP system generations, assembler language, JCL, TSO, ISPF and systems diagnostics required. Responsibilities include installing and maintain-ing MVS/SP, MVS/XA, and related products in a multi-CPU, multi-site environment.

COMPUTER PROGRAMMER ANAL VST

2-5 years experience with large scale IBM systems, preferably 3083 or 3081 using IDMS and proficiency in CDBOL required. Ability to lead large complex projects mandatory, and a related college degree is essential. Responsibilities include analysis of material/production control systems or financial/administrative areas of the corporation.

Working with Newport News Shipbuilding, you Working with Newport News Shipbuilding, you will enjoy a competitive salary and an outstanding benefits package. For a prompt reply, forward your resume with salary history/requirements to: Mr. Larry Peek, Newport News Shipbuilding, 3800 Washington Avenue, Newport News, Virginia 23607.



Newport News Shipbuilding

A Tenneco Company

U.S. Citize

MIDWEST'S BEST ILLINOIS - INDIANA

Since 1966, many of the nations best organizations have turned to INDECON for the finest in consulting and systems development. INDECON MEANS RESULTS TO OUR CLI-ENTS. We have immediate openings for:

PROGRAMMER ANALYSTS - To design and code NEW systems utilizing COBOL or PL/1 in MVS environment. Strong preference for IMS DB or DC, CICS or DL/1.

**REAL-TIME MICRO'S - COMPUTER SCIENTIST or ENGINEER to design and write INTERRUPT-DRIVEN Assembler software at module level. Highly Creative Environment.

**SYSTEM SOFTWARE PROGRAMMERS/DBA's - Expender year technical base in any of these area; IMS CICS.

pands your technical base in any of these areas; IMS, CICS, MVS, SDLC, Gen's or Tuning.

• 8100 PROGRAMMING or SYSTEMS - Direct involvement in applications development or systems (DPPX or DPCX) for a 40 + 8100 network.

DEC INTERNALS - VAX/VMS or RSTS-E on VAX 11/780.
 DEC 10/20 - COBOL or FORTRAN.

. INFORMATION CENTER - FOCUS, ADRS with PC's.

Send resume including salary requirement to Dept-0055.

INDECON, INC.

935 Merchants Plaza East Indianapolis, Indiana 46204 **EQUAL OPPORTUNITY EMPLOYER** Computer Programmer/Scientific, develop, test, implement and document computer programs in High Order Languages for aerospace applications. Experience on the DEC PDP 11/70; M.S. in computer science. 6 months opporarming DEC PDP 11/70; M.S. in computer science; 6 months programming training. 40 hours per week. \$26,800 per year. Job site: Manhattari Beach, CA. Send this ad and resume to Job #9146, P.O. Box 865, Sacramento, CA 95804 no later than 8/28/84.

SYSTEMS ANALYST

PRODUCT DEVELOPMENT MANAGER

opment of software systems involving the utilization of sophisticated mathematical algorithms. Qualifications: thorough knowledge of quesing theory, stockastic process and compler design. Must have extensive experience sin Modular-2 and 280 as well as 8086 assembly languages. At least 1 year of experience. Masters Degree in mathematics. \$1,000/week. Job sine: Sootts Valley, CA. Send this ad and your resume to Job #2562. P.Q. Box 865, Sacramento, CA 95604, not later than 8/30/8/4.

PERSONNEL OFFICE WASHINGTON UNIVERSITY BOX 1184 ST. LOUIS, MISSOURI 63130 Affirmative Action/ Equal Opportunity Empl

FLORIDA

Our clients require your experience on IBM, DEC and Burroughs hardware now! All fees, interviewing and relocation expenses assumed by our clients. PROGRAMMER ANALYSTS SYSTEMS ANALYSTS DATA BASE ANALYSTS SYSTEMS PROGRAMMERS

Call or send your confid Mr. Wils Bell KTA 5151 Adanson Street Suite 104 Orlando, FL 32804 or call (305) 628-2633

WASHINGTON, D.C.

EDP AUDITOR

Dynamic high-tech industry fore-runner seeks outstanding EDP Au-ditor. Large professional environ-ment! Many system development responsibilities. CISA, CIA or CPA are pluses. \$35K.



ational Registr openings & prof

P.O. Box 19949, Dept. CWU Houston, TX 77224 Please send resume.

ntific Placement, Inc

COMPUTERWORLD

The Recruitment Connection...

... the best connection to have when you are looking for quality computer professionals. There is a good reason why **COMPUTERWORLD** is the number ONE computer industry trade newspaper. No other newspaper of its kind can give you the broad exposure that you will get by advertising in COMPUTERWORLD. It is read by over half a million people, most of them top-notch professionals with top-notch computer companies.

COMPUTERWORLD publishes every Monday and the deadline for receiving your advertisement is always ten days prior to the issue date desired. The open line rate is \$9.15 per line with a minimum size of 2 column inches. Send in either camera-ready material or cleanly typed copy with a layout if desired. We also have a tele-copier service and adtakers who will gladly take copy over the phone.

Our mailing address is COMPUTERWORLD, Classified Advertising, 375 Cochituate Road, Box 880, Framingham, MA 01701.

Or call for more information at 1-800-343-6474 or, in Massachusetts, (617) 879-0700.

COMPUTERWORLD

The best connection to have.

> The only connection you'll need.

The Last Career Move You'll Ever Want To Make.

Now is the time to make your move. The people who have already made that career move are catapulting us to the top of the computer service industry. With 35 offices nationwide, we are looking for highly motivated professionals to support over 30 DEC SYSTEM 10s and 20s, currently running Tymshare.

Senior Systems Programmers

The selected applicants for this senior-level position will be responsible for developing, enhancing and maintaining our operating systems on 36-bit machines.

We require at least 3 years of experience in the designing, coding, debugging and installation of operating systems software on 36-bit machines. Assembly language programming experience on 36-bit machines is a must.

Systems Programmer

The qualified candidate for this position will be responsible for the support and development of language compilers, object time systems and other support software. Knowledge of language compilerinterpreters for high level languages such as COBOL, FORTRAN, Passal, SAIL, USP, etc., is required.

Knowledge of 36-bit (DEC 10/20) utilities and operating

Associate Systems Programmer

For this challenging position we want someone to work under the direction of Senior Systems Programmers to assist in the development, enhancement and maintenance of our 36-bit

We require at least 1 year of DEC 10/20 operating syster programming experience. Knowledge of associated language and utilities is desirable.

Technical Writer

An experienced Technical Writer is needed to be responsible for the development of technical documentation for 36-bit system software and its internal applications. In this position, you can be instrumental in the development of documentation procedures and standards.

Candidates must be able to write highly technical documentation for internal and external use, to include manuals for operating systems, languages and utilities.

Now is the time to make your movel For immediate consideration please send your resume, salary history and the job title listed above that you feel most qualified for, to: Tymshare, Inc., Computer Systems and Support, 39100 Liberty Street, Fremont, CA 94538, ATIN: C.M. Fletcher or J. Mosser Ad #058. An Equal Opportunity Employer mlf/hlv.



HONEYWELL **PROGRAMMERS**

This may be your opportunity to be involved in the Space Program. Lockheed Space Operations Company is the prime contractor for the Shuttle Processing Contract. This long range contract involves the prelaunch preparation, support and enhancement of the orbitors and their associated support equipment/facilities.

If you are an experienced computer professional whose goal is more challenging and rewarding work in a state-of-the-art environment, look to Lockheed Space Operations Company. We are hiring a number of professionals, like you, to fill opportunities involving the development and enhancement of Management Information Systems. You will be working in a team concept with professionals like yourself furnishing technical diwith professionals like yourself, furnishing technical di-rection in consultation to in house staff and interfacing with support teams as an individual technical contribu-tor. Our environment is a multi-Honeywell 6680-S, utilizing DPS-8 converting from IDS I to IDS II with DM 4 programming in COBOL.

For immediate consideration, please call Donald C. Quirk, at (305) 268-4070. Or send your resume to:

Donald C. Quirk

LOCKHEED SPACE OPERATIONS COMPANY 1832 Garden Street Titusville, Florida 32796

Table Lockheed Space Operations Company

LEADERSHIP IN TECHNOLOGY

あなたの 希望する職業を。 あなたの国 本で、

The challenging career you've imagined is the one that awaits you at Nippon Motorola Ltd., Semiconductor Operations — a world leader in the design, development and manufacture of microelectronic components and systems. We are seeking professionals who possess Japanese citizenship and/or permanent residency who desire to live and work in Tokyo as part of the innovative team at Nippon Motorola Ltd., commonly referred to as NML.

Over the past 22 years, Nippon Motorola Ltd. has built a reputation for superior performance in the desire development and marketing of advanced semiconductor.

performance in the design, development and marketing of advanced semiconductor equipment and systems, including state-of-the-art communications and aerospace products. As we continue to provide one of the world's fastest growing semiconductor markets with technologies that exceed present standards, the opportunities for professional advancement are exceptional. The following opening currently exists within the Information Systems Operation and requires fluency in Japanese and English

MIS Manager — You will be responsible for building and managing the grow of an MIS department that will ultimately support the entire NML operation. Creativity and attention to the smallest detail are essential to the success of this developmental effort. Qualified candidates will possess 5-6 years management experience within the MIS field, plus a BS in Business with Computer Science emphasis or an MBA in Information Systems.

What could be...is. At Nippon Motorola Ltd. The career you want. In the country you love. Experienced candidates who are interested in returning to Japan are invited to send their resumes to: Fred Miles, Motorola Inc., Semiconductor Products Sector, 1140 S. Priest Dr., Tempe, AZ 85281, Dept. 1N15.

What could be ... is.



MOTOROLA INC.

Nippon Motorola Ltd., Semiconductor Operations An Equal Opportunity/Affirmative Action Employer

*Imagine the career you want. In the country you love. Japan

OPERATIONS MANAGER SYRACUSE UNIVERSITY ACADEMIC COMPUTING SERVICES

Academic Computing Services runs 3 iBM 4341's under VM/CMS and MVS and a DEC-system-10 under TOPS-10 as well as an ex-

MANAGER/ENGINEERING DEVELOPMENT

SPECTRAGRAPHICS is a forerunner in the design and production of the most innovative graphics work-stations available today with a work environment as sophisticated as the product.

Having a vested interest in the company is as vital as having your heart in it. We offer a stock option plan and extensive paid benefits, as well as programs to keep you up-to-date on company growth and in tune to our innovative steps in the industry.

tune to our innovative steps in the industry. This is a newly created position in San Diego. We're looking for a hands-on manager to be responsible for creating the department that develops computer systems and software used in our engineering work-stations. It requires 5 + years as a project leader manager in a software/hardware development environment. An in-depth knowledge of operating system development and computer architecture are necessary. Experience with UNIX a plus. MSCS or MSEE desirable.

Send resume or call: Lynne D'Agostino 800-821-4822 • (619) 450-0611 within California 260 Sorrento Valley Road • San Diego, CA 9212

SPECTRAGRAPHICS

Computer

Be part of NCR's exciting new products. And new market expansion.

NCR is a dynamic market-driven \$3.7 billion company. Our ATM achievements are leading us into self-service terminals for airline passengers, hotel guests, and fuel service station customers. And we're pioneering optical encoders for remote reading of utility meters.

These very active new product development programs mean high or-der of professional challenge for talented specialists. Get in touch promptly if your credentials match these openings:

Sr. Engineer—Systems
Will be responsible for F/W based O/S definition of new self-service product. Will help develop communications protocols and device drivers, evaluate industry proprietary protocols and their application to MRX-based terminals. Will evaluate variations of airline protocols, and provide enhancements to O/S drivers and F/W needed for connectability to selfservice terminals. Should have communication experience, as well as knowledge of 8080, Basic, Bisync, SNA. BSEE/BSCS required.

Systems Architect

Systems Architect
Will be systems architect for self-service products, design self-service
fuel systems for new markets. Interfaces include switches, gas pump
controllers and selfservice fuel terminals. Will develop technology
strategy, evaluate competitive systems, do systems design and test
all levels of the system. BSEE/BSCS with 4-5 years systems experi-

Sr. Programmer Analyst

Will help establish system definition for new products, new O/S development and testing-including communication protocols and device drivers. Credentials in systems architecture, design, programming, debugging, firmware O/S, device drivers needed-plus experience with intelligent terminal H/W and S/W. Background in microprocessor F/W development and communication helpful. BSCS/BSEE with 4-5 years experience.

We are located in the rolling foothills of the Blue Ridge Mountains in Northwestern South Carolina. The area offers extensive lifestyle-/cost-of-living advantages. Nearby Clemson and Furman Universities provide excellent resources for pursuing advanced degrees. Salaries and benefits package are fully competitive.

For prompt confidential consideration send resume, salary history, and position preference to: Ms. Terrell Isaacs, Employment Manager, NCR Corporation, E&M/Clemson, Dept. U56, 1150 Anderson Drive, Liberty, South Carolina 29657



Celebrating the future

An equal opportunity employer

VICE PROVOST FOR COMPUTING AND INFORMATION SERVICES

The Vice Provost for Computing and Information Services leads an organiza-tion responsible for meeting the computing and information needs of the facul-ty, staff and students of Brown University. Areas of responsibility include the development, management and support of administrative and academic appli-cations on both centralized and distributed systems.

cations on both centralized and distributed systems. Brown is engaged in an effort to develop a new computing, information and communications environment based on hierarchies of networks of graphics-based, personal computer workstations, with access to mainframe computing and informations servers. The success of this endeavor depends upon imple-menting an effective and graceful inigration strategy from a centralized to a dis-tributed environment. The Vice Provost will be expected to lead the reshaping and development of the current computing service organization so that they can provide the University community with the support and new tools neces-ary to meet its growing needs in education, research and administration. Increased financial and personnel resources are being provided to assist this de-velopment.

Close cooperation among the computing and information service organizations, the basic research group (Department of Computer Science), and the systems research and development organization (Institute for Research and Information and Scholarship) is required. The Vice Provost should have the skills both to collaborate with these groups and to implement operational plans successfully. The Vice Previous will report to the Provost and must work closely with the Srior Vice President for Finance and Administration and other senior administration and other senior administration.

Applicants should have a college or university degree in a relevant area and sig-rilicant experience as a leader of a major computing operation. Experience should include the development and support of applications for administration, education and research. Familiarity with computing services in a university is desirable. A thorough working knowledge of state-of-the-art hardware and software technologies is required. In choosing a candidate, the Search Commit-tee will look for evidence of leadership and planning ability, technical knowl-edge, and management and inter-personal skills. Send nominations and applications to:



Provided and Dean of the Faculty
Box 1945 Brown University Providence, RI 02912

deadline for completed applications is October 1, 1984.
WHI INIVERSITY IS AN EQUAL OPPORTUNITY, AFFIRMATIVE ACTION EMPLOYER

EYSTEMS SOFTWARE PROCEssassers integrate CDC NOS Cirsy Station into a multinications software, maintain other data communications software, without a communications software, which data communications software, other data communications software, other data communications software, other data communications software, other data communications software properties and the software some software some service of the software some software services of the software some software some software programming required. Salany \$26,000 to \$39,589,v. Equivalent or additional experience may be socialized for a degree.

H.P. 3000/MFG \$30-40,000

Leading hi-tech manufacturer in Twin Cities seeks all-around analyst to become #2 person in growing installation. Top-notch abilities with users very important to the successful candidate. Requires 2 yrs. H.P. 3000 exp; FORTRAN and Manufacturing background helpful. Job #6444.



MARK DAVID or TIM SMITH ROBERT HALF 3636 IDS Center nneapolis, MN 55402 (612) 339-9001

Applications Engineering

The Tektronix Frequency Domain Instrument Division, maker of the highly regarded 49X series of spectrum analyzers, offers immediate career opportunities for candidates interested in the development of applications programs for our worldwide spectrum analyzer market. The successful candidate will have had previous experience in the development of software and software support for IEEE-488 bus-compatible products, as well as a comprehensive knowledge of microwave and RF measurements and applications. Preference will be given to candidates with exposure to marketing, sales or customer training environments.

The above listing is just one of the varied career options available in FDI, which also provides opportunities in such areas as business applications programming, microwave systems design, product marketing and instrument manufacturing. We ofter competitive salaries and excellent benefits including educational support, insurance and profit sharing programs plus the chance to make a real contribution to exciti plus the chance to make a real contribution to exciting projects. Send detailed resumes to Carol Mountain, MS 58-026, Tektronix, Inc., P.O. Box 500, AMP1, Beaverton, Oregon

Tektronix

PROGRAMMER

Requirements: Min. 3 yrs. programming experience in RPG III (pref. RPG III), strong interactive application & documentation background and experience on S/34 (pref. S/38). An experience on S/34 (pref. S/38). An experience equal opportunity employer M/F/H. Send Resume to:

CW-B4047 Computerworld Box 880 Framingham, MA 01701

PROGRAMMER **ANALYST**

A dynamic state of the art computer facility seeks an individual with 3 to 5 years of programming and on fine systems experience. Knowledge of COEOL, opensting software, opensting software, opensting software, of the systems of the

EDP AUDIT

International mfg concern International mig concern has oppty for top grade indiv. 5+ yrs exp. Knldg of VM/CMS, OS/JCL, CICS, PL 1 & COBOL. Mini exp req'd. Domestic & some int'l travel. \$45,000 FEE PAID

ROBERT HALF 522 Fifth Avenue New York, N.Y. 10038 212-221-6500

SYSTEMS PROGRAMMER

S Department is seeking to fill a position oporting application systems which affect aspects of a manufacturing operation. We upte an experienced person capable of de-n and maintenance programming in our en-norment, running on an IBM System/38 with tit-manufacturing locations.

MIS Manager AMF Head Division Box CN 5227

There's No Time For DOWNTIME!

And that goes for your business as well as your computer system!

So, while the industry works on your system's problems, let us work on your business problems. Advertise in-

COMPUTERWORLD CLASSIFIEDS!

One insertion will let a potential audience of over a half a million readers know what you are looking for or have to offer. Whether you are looking to recruit computer profession-als, want to buy, sell or lease equipment, have computer time or services to offer, or software packages to sell, and more, Computerworld Classifieds will help you get a lot of exposure and get things done faster.

The open line rate is \$9.15 per line and there is a minimum size of 1 column by 2" at a cost of \$256.20. We can accomodate up to 5 columns and depth measurement increases by half inch increments.

Ads may be mailed in, cleanly typewritten, with a letter stating the size desired and the issue in which it is to be run. Our adtakers will take ads that require no extensive artwork or borders over the phone. We also provide telecopier service.

Any borders, logos, or artwork should be sent in with your ad and must be dark and clear enough to be reproduced.

Computerworld comes out every Monday and our deadline for receiving ads is 10 days (or six working days) prior to the issue date desired.

First time advertisers must send either payment or a purchase order along with their first ad.

Our mailing address is:

Classified Advertising Computerworld Box 880, 375 Cochituate Road Framingham, Mass. 01701 800 343-6474; (617) 879-0700

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS



HOGAN

DDA **ANALYSTS** TDA PROGRAMMERS

Computer Power, Australia's leading software house and representatives for the Hogan Banking Systems in Australia, need Analyst/ Programmers now for 12 month contracts

Location will, be Sydney, one of the world's most beautiful cities, where the sunshine and beaches can enhance the quality of your life-

Return airfares are included in the contract and working visas and accommodation will be arranged on your behalf.

If you have experience in project management programming, systems programming or analysis of Hogan systems, then call Computer Power or send your resume by courier to Computer Power.

Call Moray Robertson on this number now (214) 556-2930 or telex Australia: AA 70977 Setay or send your resume to:

MORAY ROBERTSON COMPUTER POWER

5215 North O'Connor 2nd Floor Irving, Texas 75039

GOOD THINGS HAPPEN ON THE CHESAPEAKE BAY

CAREER OPPORTUNITIES IN THE LAND OF PLEASANT LIVING

THE LOCATION: Historic Southern Maryland where the Chesapeake Bay lifestyle is augmented by the Atlantic beaches, Blue Ridge mountains, and the attractions of Annapolis, Baltimore, Georgetown, Washington, D.C. and

THE CAREER: Significant opportunities for career growth and professional advancement designing, developing, implementing and integrating complex industrial automation systems for serospace, manufacturing and

THE REQUIREMENTS: Interested applicants should have excellent skills in one or more of the following:

- QLP DMS 1100
- DATA BASE DESIGN TELECOMMUNICATIONS LOCAL AREA NETWORKS

INDUSTRIAL AUTOMATION FROGRAMMING/ANALYSIS

Tandem 16 TAL .

PATHWAY .

ENFORM

THE BENEFITS: .Excellent compensation package and organizational climate in a rapidly growing fifteen year old contracting and consulting compa

THE PROCEDURE: To schedule an interview call Donna Lyon collect at (301) 863-7200 or send your resume to:

DYNAMAC

P.O. Box 680 Lexington Park, MD 20653

Software Engineers!

Xerox introduces a team approach to the future.



Our Resources: Your Resourceful Mind.

Office Automation. It's heralded as the answer to industry's declining white-collar productivity. Where will the office of the future take us? What will it take to get us there?

Xerox feels the answers lie in a collaboration of resources. We call it TeamXerox. Our proven resources. We call it TeamXerox. Our proven resources: product development, management skills, strategic planning and a firm foothold in today's office is part of the solution. You are the other. Your resourceful mind is the catalyst behind problem-solving innovations, and imaginative planning to keep technology one step ahead of demand.

TeamXerox. It's our approach to an exciting future. Be a part of the success. We have opportunities for Software Engineers at our Information Products Division in Dallas, Texas. Qualified applicants must have the following general credentials:

- •1-10 years product development ex-perience with recent experience on Mini/Micro computers with office
- Experience with Assembler language and either PASCAL or C languages.

•A BS or MS in Computer Science is highly desirable.

•Experience with CP/M, MS/DOS or UNIX.

The successful candidates will apply their soft-ware development skills in the following areas:

•PROFESSIONAL WORKSTATION **ELECTRONIC TYPING**

*COMMUNICATIONS

Qualified candidates must have U.S. citizenship or be a registered alien.

As you would expect from an industry leader, As you would expect from an industry leader, Xerox Corporation can offer you an exceptional salary and benefits program along with a relocation package. Send your resume to: Employment, Xerox Corporation, Information Products Division, MS 180, Dept. CW8-13, 1341 W. Mockingbird Lane, Dallas, Texas 75247. Xerox is an affirmative action employer. action employer.

SYSTEM DEVELOPMENT MA MIDDLE EAST

Our client runs one of the most sophisticated and progressive computer facilities

It is based on multi-mainframe CPU's with a number of special purpose minis and micros supporting an extensive network and a decision support centre.

A US dollar 55,000 tax free salary plus free accommodation and the usual Middle East benefits package indicates the calibre of candidates we seek. The successful applicant will be responsible for all aspects of systems. In order to qualify, candidates must have:

> Managed a Large Development Managed a Major Client Interface Managed a Database Development Managed All Aspects of a Large Project

This is a high visibility appointment offering immense rewards in terms of responsibility, of working in the forefront of technology and in the potential offered to the right candidate.

Mainframe CPU's include IBM 3083, 4381, 4341's, etc. Though experience of working in a large IBM complex is highly desirable, it is not essential, as this is primarily a management position.

INTERVIEWS WILL TAKE PLACE END AUGUST, 1984.

Please send a detailed resume to Mr. L. Fallin, 86 Milaw Court, San Ramon, CA 94583, quoting Ref. 5102.

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

WE'RE TAPPING AN ANCIENT RESOURCE . . .

The Human Imagination.

More than ever before, Southern California Gas Company is seeking better ways to optimize the use of energy. Whether it's discovering ways to squeeze the most oil from shale deposits or creating better information systems to streamline business operations, innovation is the key resource of energy conservation.

We're currently looking for innovative computer pro-fessionals with imagination, drive and experience in a large IBM mainframe environment for our Information Systems Department.

9 005 TSO (SPF)

SYSTEMS ANALYSTS 7-10 yrs. experience

We need high-callber Systems Analysts to define, design and formulate proposals for new systems and/or enhance existing systems. Systems Analysts would also provide work direction and technical counseling for individual(s) in a results-oriented D.P. department.

SR. PROGRAMMERS 4-6 yrs. experience

Senior Programmers are needed to coordinate team activities; test and debug programs; implement and support business systems. Responsibilities also include writing program instructions and complex technical programs.

COMPUTER PROGRAMMER 2-3 yrs, experience

As an experienced Computer Programmer, you would develop and maintain on-line and batch programs; test and debug programs and systems.

We are interested in Programmers with 4 year degrees in Computer Science, Business or Accounting and a minimum of 2-3 years experience with large IBM mainframe computers.

All positions require a 4 year technical degree; proficiency in COBOL, OS-JCL, TSO (SPF), and familiarity with CICS applica-

Candidates should have effective spoken and written com-munication skills. U.S. Citizenship or permanent resident visa is

uit your resume and salary history to:



Jeanne E. Camp Professional Staffing Coordinator Southern California **Gas Company**

P.O. Box 3249, Terminal Annex Los Angeles, CA 90051

UNIX + C LANGUAGE \$35,000 - \$50,000

Advanced Programming Resources, Inc., a dynamic growth oriented Contract Services organization specializing in Consulting Systems Design and Programming Development, has an immediate need for seasoned Software Engineers.

Must have a degree in Computer Science or Electrical Engineering, 2 or more years programming experience using "C" Language, PASCAL_or PL/1, UNIX Operating System. Working knowledge of Network Protocol and multiprocessor systems helpful. Knowledge of VAX or other mini computers required.

APR provides above average benefits and compensation. If you feel you want to join the leader, please send your resume' in confidence to:



ADVANCED PROGRAMMING RESOURCES, INC. 6800 North High Street • Worthington, Ohio 43085 • 614/888-3968

"An Equal Opportunity Employer"

COMPUTER PROGRAMMING, SYSTEMS AND **ENGINEERING PROFESSIONALS**

National employment resources at your service. Through our screened and selected employment affiliates, we'll get your resume to remployers with applicable job openings in your targeted geographic areas. Openings for systems software and all kinds of applications programmers and analysts, EDP marketing and support reps, hardware and software engineers, EDP technical writers, etc. A quick and easy way to cover the job market. No fee, contract or obligation.

At least two years of professional experience required, U.S. citizens and permanent residents only. Send one resume along with current and desired salary, destreed location and a summary of your computer hardware and software expenience to.

NATIONAL CONTACT NETWORK, INC. Ref. CW, 3100 West Chapel Avenue Cherry Hill, N.J. 08002/(609) 667-4080

Senior System Design Engineer
Will conduct research and development
for design, manufacture, and testing of
new micro-processor based trickness
coding measuring systems and equipment. Development of new computer
hardware and software required for certaing equipment. Directs Junior Engireating equipment. Directs Junior Engiment apparents and test procedure.
Knowledge of Assembly language and
TCI high level programming language
required. M.S. in Electrical and/or Computer Engineering. Five days; 40 hours
per week. Salary SSB0. per week. Apply with resume to: Twin City International, 175 Pinerview Drive, Buffalo,
New York 14150

MIS DIRECTOR

needs a creative thinker to direct its growth. Requires strong communications skills and Currently using packaged software to provide data support to large minetal health center just north of Boston. Öffering competitive sally, to the company of the control of the control support of suppor

control of the contro

SENIOR CONSULTANT

contents to develop management and lectrical procedures related to computer capacity planning. Design and implement software expensing of the season of the

If offered employment, must show you have the legal right to work.

EDUCATION

IDMS/CICS/IMS/ VTAM/VSAM

Courses with unlimited lab time. Lab time 9 am to 9 pm, Monday thru Thursday, 9 am to 5 pm Fri-day and Saturday.

On our own computer with 20 IBM 3278 terminals. Come and check computer and terminals and see CICS and IDMS demonstration. Call (212) 777-5040 or write:

ICC8 10 East 21st Street New York, NY 10010

SALES REPRESENTATIVES SALES MANAGERS IBM COMPUTER SALES

We are a leading IBM computer dealer and lessor, seeking candi-dates for our sales and management team for our new Corporate Headquarters in Irvine. We are seeking energetic, aggressive and skillful negotiators with 2-3 years of experience in computer sales.

Our compensation package is 10-20% higher than our competitors and there is opportunity for advancement into management. For more information about this successful company and challenging position send resume and salary history to:



Marshall Lewis & Associates, Inc. P.O. Box 15310 Santa Ana, CA 92705-0310 ATTN: DL

COMPUTERWORLD CLASSIFIEDS WORK!

It's easy to advertise in COMPUTERWORLD. If you don't have an advertising agency to supply us with copy, layout and order, or camera ready mechanical, copy, layout and order, or camera ready mechanical, stat or film negative of your ad, just call one of our ad-takers at 1-800-343-6474. They will be glad to take your ad and typeset it in available fonts at no extra charge. If you have lengthy ads that require logos and artwork, just send a clean typewritten copy of your ad to the classified advertising department at COMPUTERWORLD (telecopier service is available); note the addize you want and if you want your comnote the ad size you want; and, if you want your company logo to appear in your ad, please be sure to include a camera-ready copy with your insertion order. You should also supply any special borders, headlines and artwork that you want in your ad. Our Art Department will follow your suggested layout as closely as possible if you wish to send one.

Ad closing is every Friday, 6 working days prior to issue date.

Rates: Open rate is \$128.10 per column inch. Col-umns are 2" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs \$256.20 per insertion. Additional space is available in half inch increments. Some sample sizes and costs are shown.

> 1 col X 4" - \$ 512.40 2 cols X 4" -\$1024.80 2 cols X 5" -\$1281.00 2 cols X 8" -\$2049.60

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available, \$15 per

To reserve space for your ad, or if you'd like more in-formation on Classified advertising in COMPUTER-WORLD, call our office nearest you.

> Boston - (617) 879-0700 or (800) 343-6474

San Francisco - (415) 421-7330 Los Angeles - (714) 556-6480

TELECOPIER SERVICE (617) 879-0700 or (800) 343-6474 ext. 451 or 410

Cynthia J. Delany, Classified Operations Manager

BUY - SELL - SWAP



Tested/Audited/Refurbished

EERIES 1 & New or Used, CDC Peripherals—New or Used, Most I/O in Stock, Features Sold Separately; SYSTEM 34 & 48 Hour Upgrades, CRT's and Printers in Stock, Any System—14 Day Delivery; SYSTEM 38 & 581's in Stock, Memory, Communications, Tape, Disk, CRT's, SYSTEM 36 & Trade In Your Sys734 Operating Leases; 4300 & 3380, 3370, 3420, 3350, 3375, 3430, 3278, 3276, 3274; 5110 & SY3's and \$120's in Stock P.O.S. & 5955's an 3420, 3530, 3573, 3430, 3450, 3267, 3267, 3410
\$223's and 5120's in Stock; P.O.S. & 5265's a
Specialty, Upgrades/Downgrades, Short-Term Leases,
3600/4700 & Banking, LEASING & Xerxes offers
a complete range of financial services including leverage leases, operating leases and short-term rental;
MAINTENANCE & INSUMMINIERANCE of a discount. We use a combination of our engineers and usvs—call for details. Attention to detail means smooth installa-tion and full support.



1614-Harmon Place, Minneapolis, MN 55403 800/328-3884, 612/339-3042

Contact Datacomp and find out how much you can save... 800/323-3289 datacomp leasing & service group Chicago ■3 A-1 Dun & Bradstreet rating ■ 2500 Satisfied Customers ■ IBM Know-ledgeable Professionals ■ Satisfaction Guaranteed

Inflation Fighters

Quality & Savings

Slightly used, Money Back Guara Full Reefs. All External Labels Rem Guaranteed for use at 800 BPI thr

2400' Reel \$4.95 ea. 1200' Reel \$4.25 ea. 600' Reel \$3.50 ea.

All Tapes with Hanging Seals We pay freight on orders over 200 tapes All orders shipped within 48 hours. Call or Write

Computer Tape Mart 44A Seabro Avenue N. Amityville, New York 11701 [516] 842-8512

GENERA

We Buy, Sell And Service

New And Surplus Systems and Peripherals

Call Or Write Hanson Data Systems

1-800-225-9216

(617) 481-3901

P. O. Box 27, Southboro, MA 01772

VAX SYSTEM

TOTALLY INTEGRATED 80 Characters Per Second Letter Quality Parallel Printer \$1,600 6250 Tri-Density Drive With Formatter And Cabinet \$25,000





COMPUTER SYSTEMS 5105Q BACKLICK ROAD, ANNANDALE, VA 22003

BUY SELL SWAP

BUY SELL SWAP

BLIY SELL SWAP

BUY SELL SWAP

Will the real lessor please stand up!



Who do you want to deal with during your computer lease?

An investor?

An insurance company?

A consortium of banks?

Or your leasing company!

As computer experts, we understand your individual equipment requirements. Hartford Computer Group doesn't sell your leased equipment to an investor who will not understand or care about your requirements.

When you sign a lease with Hartford Computer Group, you deal only with us, We maintain complete ownership and control of your leased equipment and can therefore give you the flexibility yourwant in a computer lease. We can do this only by refusing to participate in tax-advantaged leasebacks that give investors control over your leased equipment. Tax-advantaged leases allow for little or no flexibility!

We give you Hartford Computer Group. Want to lease computer equipment? Want to upgrade your computer equipment, renew your lease, or change your leased system completely? With no outside investors or participants to inhibit your transaction, Hartford Computer Group is free to offer the ultimate flexibility in customer service.

You deal with one company, before and after the lease begins, the real lessor... Hartford Computer Group!

Your questions about our unique computer leasing program are answered in our brochure. Write or call for your copy.



Hartford Computer Group

A Subsidiary of Hartford Financial Corporation 515 East Golf Road, Arlington Heights, IL 60005 800 323 6355

or 312 364 0505

The nationwide market - a call away:

SYSTEMS PARTS PERIPHERALS NEW/USED/SURPLUS · DISCOUNT PRICES

Since 1977! Buy, Sell, Trade and Broker.

PHIL

BRYAN

JENNIFER

11-VAX

8-LSI

CALL TODAY - (305) 392-2005

TELEX 568-670

thomas business systems, inc. a 4301 Oak Circle - Unit 11 Boca Raton, Florida 33431

We're serious about (800) 328-6729

dataserv

IBM

Please Call 312 675-8000

rsythe McArthur Associates. In 7500 Frontage Road Skokie Illinois 6007

WANG EQUIPMENT

OF THE WEEK: 2256C 64K VS

WORKSTATIONS (WP/DP)

Used/Guara

- AINTENANCE AGREEM
- 15-DAY RETURN PRIVILEGE

EDS MORE WANG PRODUCTS ILABLE -- CALL TOLL-FREE T-800-321-2986

ELECTRONIC OFFICE

SERIES 1

BUY SELL LEASE Computer Brokers Inc. Call Richard Crenshaw Toll Free 800-238-6405 Also 901-372-2622

C.D. SMITH & ASSOCIATES, INC.

DEC computer systems & options 12605 East Freeway, Suite 318 Houston, Texas 77015 (713) 451-3112 TELEX 76-2547

DEC

WE ARE SELLING VAX 11/730, 11/750, 11/780 *& MOST VAX OPTIONS

\$16,150 DW780-AA A 22 100 H7112-A ... 6,400 H9652-MF 5 150 DZ11-E ... 8,500 MS780-CE

If you want on our Mailing List, call Valerie (713) 451-3112.



For Sale **Data General** CS-70, Mod-6

2 - 96MB Disk

- 96MB Disk 9165 CS160 Terminal 4218 300 LPM Line Printer
- 6108 DA Dasher 6026 9 track tape

Call 516-561-1700 Mr. Richard Piesman

LEASE IBM 4341-2

4MB 6 Channel

Terms Negotiable

317-664-3971

Concerning computer equipment needs...

...we have an answer for everything.

- Buying Equipment
 Selling or Leasing
 Equipment
 Equipment Wanted
 Software For Sale
 Software Wanted
 Real Estate

- Auctions
- **Opportunities**

BUY . SELL . SWAP

in the COMPUTERWORLD Classified pages Call us now at 1-800-343-6474 or, in Massachusetts (617) 879-0700

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BLY SELL SWAP

RENT • BUY • UPGRADE • SELL

PDP, 11/03, 11/04, 11/23, 11/24, 11/34, 11/44, 11/70, VAX/730, VAX/750, VAX/780

SYSTEMS • OPTIONS • SUPPLIES

1MB, Dual RLO2, DZ11-A, Cabinet 256KB, Dual RLO2, DZV11-C, VT102, II 11/70 MOS & Core Configurations available VAX 750 1MB, RUA81, TU80, DMF32, VMS VAX 780 2MB, 2RMO5, DZ1118, TEE16, 600LPM Pri

Customized Configurations—Call With Your Re

11/24-BC 11/34A-YE BA11-FD DH11-AD DMF32 DMR11-M DZ11-E DZ-32AP FP11-A KDF11-AA

RUA81-AA (NEW) \$20,400 MS750-CA (NEW) . . . S 2,850 RP06-AA \$11,850

KT24 LA120-DA MK11-CE MS11-PB MS750-DC RH780 RK06-EA RL02-AK RM03-AA TS11-CA LP11-VA \$ 2,495 CALL FOR OUR FREE CATALOG



RP06 DISK DRIVE NOW JUST \$12,000.

a Installation included m 90-Day, On-Site Warranty

Now you can save a full 65% on the original \$34,000 cost of RPO6 disk drives. They are also available with controller, with dual port kit or with both at a greatly reduced price.

Of course, supplies are limited. Act immediately to take advantage of this tre-

mendous savings. To order your RPO6, contact your local Digital Sales Office. Or for more information. simply call 1-800-258-1728.

No other discounts apply. Save now by calling today.

Buy - Sell - Lease

S/34 S/36

IBM

UPGRADES

CPU'S CRT'S PRINTERS

PURCHASE/LEASEBACK **Computer Marketing**

of America, Inc.
P.O. Box 71
610 Bryan Street
Old Hickory, Tennessee 37138

0-251-2670

In Tennessee: 615-847-4031

IBM UNIT RECORD EQUIPMENT DISK PACKS-DATA MODULES-MAG TAPE-DISKETTES









SALE OR LEASE

IBM UNIT RECORD MACHINES

026-029-082-083-084 085-087-088-129-514 519-548-557

NEW & USED DISK PACKS—DATA MODULES 2316—3336(1)—3336(11)—3348(70) MAG. TAPE-DISKETTES
Every Item Guaranteed

Highest Prices Paid for Used Packs & Modules

THOMAS COMPUTER CORPORATION 5633 W Howard St 800-621-3906 Chicago, IL 60648 (IL-312-647-0880)

WHEN YOU'RE READY

TO BUY. SELL. TRADE. LEASE AX-UBUS-QBUS

DEC TERMINALS

DIGITAL COMPUTER RESALE 713/445-0082

600 KENRICK • C-22 HOUSTON, TX 77060





Computer Resources

WE ARE A FULL LINE DEALER.

P.O. Box 24026 • • 4717 Centennial Blvd

• Nashville, TN 37202 • Telex: 554458 • (615) 383-8703

data3 computer corporation IBM PROCESSORS/PERIPHERALS DPD

GSD

5/38 4331/4341 5/36 TAPE

5/34 DISK

SERIES/1 PRINTERS

TUBES

Special Features

5/3

On-time Delivery

• Upgrades

• Purchase/Leaseback

11000 Prairie Lakes Dr., Suite 600, Eden Prairie, MÑ 55344

CDLR 1-800-328-7938



FOR SALE **IBM** SYSTEM 34

5211 Model 2 Contact: Nancy Smith (702) 322-6207

NCL, INC

Specialists In The Buying, Selling And Leasing Of Word Processors

IBM Displaywriters

Immed Delivery

CDB FINANCIAL, INC.

COLA

BLIY SELL SWAP

BLIY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

Your Full Service Computer Dealer



4331/4341 303X/370

3310 Call Ext. 101

SYSTEM 34/36/38

5211 1255 3262 Modems Memorex Decision Data res Sold Separately Call Ext. 102

SERIES/1

Call Ext. 103

1000

3000

33, 64

7970E 1600 BF

encore

(213) 452-9117

TELEX

OUTSIDE TEXAS TOLL FREE 800 - 527-6438
HDOTRS: 214 - 330-7243
4573 South Westmordand
DALIAS, TX 78237
HOUSTON, TX 77034 BRANCH: 713 - 550-7356 16151 Calmway, Suite 103



IBM

34 36

4300 • 5110-5120 • 5/32

BUY . SELL . LEASE All models, systems & peripherals AVAILABLE NOW!

Ask about our 72 hour upgrades.

408) 425-7333



SOURCE

IBM SERIES 1 USERS

WE ARE BUYING THE FOLLOWING

495X --- PROCESSORS

496X --- DRIVES

197X -- PERIPHERALS

ALL FEATURES AND CARDS

STRATA MARKETING, INC.

(IN CA)

FOR SALE

IBM 4978 CRT's

MODI

Large Quantity Available

800-624-9299



NATIONAL COMPUTER

600 North Lunar Avenue • Brea, CA 92621 (IN CALIF.) 714-990-5988 TWX: 910-596-1499



AMCOM

00 W 73RD ST - MINNEAPOLIS.MN 5543 CALL TOLL FREE 800-328-7723

FORSYTHE MCARTHUR ASSOCIATES, INC.

NEW LEASE PROGRAM 3178, 3179, 3180

2 Or 3 Year Term
Customized Flexibility
Hdotrs: Skokie, IL (312) 675-8000
Atlanta (404) 953-9457 Milwaukee (414) 785-9544
Detroit (313) 540-0909

TAPE/DISK

BUY - SELL - LEASE DOUBLE DENSITY DISK 3420 TAPE SYSTEMS PAM CHRISTIANSEN (408) 241-3677

WE BUY SELLE LEASE!

BURROUGHS

Discover the DSI alternative. 800-641-5215

immediately and guaranteed for Burroughs Maintenance.

Serving the Burroughs 1440 So. Lipan, Denver, CO 80223 (303) 777-8211 Telex 756-102

for 3033/308X

New And Used In Stock BUY-SELL-LEASE

CALL DICK LEONARD 612-944-8552 FOR SALE BY OWNER IBM 6670-1 LASER PRINTER

\$15,000 OR BEST OFFER MINSTER MACHINE COMPANY MINSTER, OH 45865 HAROLD NIEKAMP 419-628-2331

DATA GENERAL

DATA GENERAL
ECLIPSE C-350 2MB
BURST
MULTIPLEXOR CHANNEL
BATTERY BACK UP
2 DISK 6060 - 96MB
800/1600 BPI TAPE
2 ALM 16 4 LINE EIA 4 SLOT COMM, CHASSIS 3285 BEDFORD ROAD MONTREAL, P.Q. H3S 1G5.

NEW **T8 DATASTREAM** PROTOCOL CONVERTERS

16 PORT SNA/SDLC call (612) 559-1799

COMPUTERWORLD

COMPUTERWORLD's paid circulation climbed to over 125,000 this spring. Folio 400 (Folio Magazine's study of trade publication performance) placed us first in total revenue. As the industry grows, so will COMPUTERWORLD. It will continue to offer the high quality news coverage and editorial content that has attracted its readers. What does that mean to you, our advertisers? Good news...in the form of wide exposure.

The Classified section of the newspaper is taid out in an attractive format and is easy to read. It offers classifications to solve a variety of problems: Position Announcements, Positions Wanted, Buy • Sell • Swap, Software for Sale, Software Wanted, Time & Services, Real Estate, Publications, Bids & Proposals, Auctions, Seminars & Conferences and The Bulletin Board.

Our BULLETIN BOARD section is ideal for the smaller companies who want a low-cost way to sell pieces of equipment (hardware or software). The BULLETIN BOARD is laid out as a quick reference for potential buyers who know what they are after.

So, as a nationwide publication, we give you the exposure you want. As a weekly publication; we give you the immediacy your advertisements need.

A number of special issues of **COMPUTERWORLD** are scheduled to run in 1984. Each of these issues will feature one aspect of the computer industry and give our advertisers a chance to reach a more select audience. These are the topics the issues will cover

August 27 - Minis & Small Business Systems
September 24 - Data Base Management Systems
October 29 - Protecting the Corporate Information Resource
November 26 - Data Communications Terminals

COMPUTERWORLD publishes every Monday with an ad dead-line of 10 days prior to each issue date. You may send in copy to be pubset or camera-ready material (velox or negative) via the mail. We provide telecopier service and will also take ads over the phone

Information concerning classified advertising rates, color costs, ad sizes, mechanical specifications along with more detailed information on the special issues is contained in the 1984 Rate Card #19 and Media Kit.

Our mailing address is COMPUTERWORLD, Classified Advertising, 375 Cochituate Road, Box 880, Framingham, MA 01701. Or call for more information at 1-800-343-6474 or, in Massachusetts, (617) 879-0700.

BUY SELL SWAP

BLIV SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

* * * * DEC * * * *

BUY-SELL-LEASE-TRADE-CONSIGN SYSTEMS — PROCESSORS — OPTIONS PERIPHERAL - MODULES - MEMORY - SPARES -

NATIONAL COMPUTER EXCHANGE (800) 624-9299

600 North Lunar Avenue, Brea, CA 92621 TWX: 910-596-1499 (714) 990-5988

"Log on with NPA, we cov

r DG computer needs from

SYSTEMS INC.

SPECIALIZING IN:

PURCHASE, SALE, TRADE, LEASE, RENT

AND SERVICE OF 1. Data General

516-467-2500 415-848-9835

NET

OR WHITE.

761 Coates Avenue • Holbrook, NY 11741 or 2322 Fifth Street • Berkeley, CA 94710

FORSYTHE MCARTHUR ASSOCIATES, INC.

NEW LEASE PROGRAM IBM 4381

2 Or 3 Year Term ustomized Flexibility Low Monthly Rent Your Delivery Position Or Ours Hdqtrs: Skokie, IL (312) 675-8000 Atlanta (404) 953-9457 ikee (414) 785-9544 9457 Milwauk Detroit (313) 540-0909



IBM. SYSTEM/36 VALUE ADDED REMARKETER (VAR)



TRACKER COMPUTER ACCOUNTING SOFTWARE Your one stop solution to Hardware, Software, Transportation and Supplies

CALL FOR OFFERINGS

1/800/LEAS-PAK

LEAS PAK INTERNATIONAL P.O. Box 759 - Hurst, Texas 76053 Lecconord

SCOTT COMPUTER LEASING INC.

CARLYN

4341 M-12 w/Console Avail 9/24/84

416-821-4440-Ed

Plus: 14-3278-002 w/4621-Now

DATA GENERAL SPECIALISTS

SPECIALISTS
FOR
Surplus New & Used
Equipment & Systems
with full depot repair facilities.
CALL US
WE TAKE THE TIME.
- WE CARE.
- UM ASSOCIATION

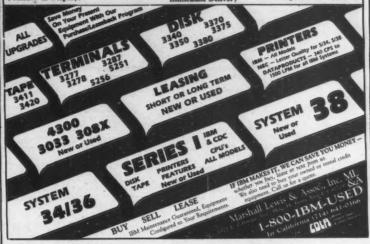
JM Associates 601 W. Chapel Avenu Cherry Hill, NJ 08002 609-663-1115

SERIES I SPEC Control Data

126MB Removable Drives : . \$12,900 Diskette Drives ...\$ 1,495 Printers & Displays

New or Used ediate Deli

IBM 4956 Processors 4967 200MB Disk Drives All Peripheral & Features



SYSTEMS

4341 4331

38 36 34 3

32

BUY . SELL . LEASE

COMPUTER BROKERS, INC. 2978 SHELBY ST. MEMPHIS, TENNESSEE



SERIES 1

Call TOLL-FREE 800-238-6405 901-372-2622 PERIPHERALS

3203 3370 327X 3411 3350 3420

THE SOURCE FOR

· BUY · SELL · LEASE NEW OR USED

MIC COMPUTER SALES

(901) 767-9130 or (800) 238-3098



WE BUY • SELL • LEASE

JOIN THE MANY FORTUNE 500 COMPANIES THAT UTILIZE IBM EQUIPMENT FROM TEXCOM...THE IBM SPECIALISTS

$4331/4341 \cdot 4361/4381$

We buy, sell or lease . 2, 3, 4 year leases WE'VE GOT IRM PERIPHERALS

3803 3375 3880 3350 3203 3811 3420 3380 3340 3370 3211 3262

IBM S/34 - 36 - 38

All upgrades available now • 1, 2, 3 year leases We'll take S/34 trade-ins WE'VE GOT ALL IBM PRINTERS AND TERMINALS PLUS 3864 MODEMS NOW.

SERIES/I

All features and peripherals . Convenient leases We buy, sell or trade

WE WANT TO BUY

IBM PC'S - IBM XT'S AND IBM DISPLAYWRITERS

CALL TOLL FREE: 1-800-833-9119 SAN ANTONIO (512) 349-9955 MEMPHIS (901) 756-7055 HOUSTON (713) 890-8714

28



3375's , B1, B1, D1 4381's

3274 3880 3803 3278 3178

DASD 3380 3375 3370 3350 3344 3310

3420 3430 3410 8809

Buy, Sell & Lease IBM Processors and Peripheral Equip



Computer Marketing Inc.

9710 VENTNOR AVENUE MARGATE, NJ 08402-2223 609/823-6000 • 800/345-0005

Contact/Bernie Gest

CDLA

The Bulletin Board

Buy · Sell · Lease Buy · Sell · Lease

Buy · Sell · Lease

Buy · Sell · Lease

NCR

For Sale

NCR SYSTEM - 8251 - 128KB, 30MB Disc, 3 CRT's, 300 LPM Printer, 50 LPM Printer - \$5,000 O.B.O. -

HONEYWELL

LEVEL 6 & DPS 6 EQUIPMENT **NEW & REFURBISHED**

NEW & REPUBLISHED
Systems - Peripharals - Memory
CRTs - Applications Software
ANNOUNCING 3 COMPATIBLE
L8/DPS6 PRODUCTS
- 1000 And 1500 LPM Band Printers
- 300 MB Winchaster Disk Drives
- SA7800 CRT (Synch/Asynch)
Emplates

Emulates VIP 7801/2, 7804/5 And 7814

Low Prices - Prompt De Boudreau Comput Services Ltd. 100 Bearfoot Rd. forthboro, MA 01532 (617) 393-6839 TWX 710-347-7574

(4) MSU 400 disk drive 100 MB \$5,000 each

Joe Ennis (904) 737-7730 ext. 130

IBM

BUY SELL LEASE TRADE

S/34 S/36 S/38 able Now All System 5340-C23, E35, F37 5360s All Models

3262s 5256 Model 3s 5251 Model 11s 5291 Model 1s 5251 Model 12s ediate Delivery ad IBM Mainte

PROCOM

For Sale or Lease 3274's

From \$300 Per Month 4341-L2/M2.....Now From \$3,000 Per Month 4341-L1 to L2 Upgrade Installed Price \$70,000 Now (10) 5251-11....

SYSCOMP St. Paul, MN (G12) 292-9922 Clearwater, FL (813) 799-4310

BuySell Lease **IBM MICR** 3890 - 1419 1255 - 3694

Buy - Sell - Leasa

IBM Cougar Computer Corp. Suite 219 26250 Euclid Office Plaza Euclid, OH 44132 (216) 261-3500

IBM

FOR SALE(All S/34 Upgrades & Sys.) 54 Meg Upgrade (5/34) 5/34-C23 (64K/27Mb) 97.500. 3/34 Memory (Any increment) Magazine or 2D Diskette Rdr. (S/34) Series 1 (128K) WANTED 5/381-581 S/34 & 3310 None Cheaper? DATAMARC (404)252-7480 6065 Roswell Rd., Atlanta, GA 30328

PC's S/34's

5251-11

In Stock Now For Immediate Delivery The Field Support Group (904) 589-4885

S/34 S/36 S/38 All Models & Peripherals Feature • Disk • Memory UPGRADES

\$1750 \$1750 \$4000 \$9400 92% of IBM List

3278's

Sale \$1150 Lease \$30 - 3 Years \$40 - 2 Years/\$60 - 1 Year SYSCOMP (813) 799-4310

IBM SYSTEM 23

with Printer BRADS software for Business Report Application Development Charles Alexander 215-768-6968 or 6672

LEASE

IBM 4341-2

4MB 6 Channel Terms Negotiable 317-664-3971

WANTED 4331

Call Bill Hegan (914) 238-9631 Computer Merchants Inc.

IBM SYSTEM 34's

Any Model or Configuration Disk and Memory Upgrade Available Within 30 Days 5340-C23 \$6,000 Eligible For IBM Maintenance

Call Pat (313) 852-2250 ext. 5

SERIES 1

Buy/Sell/Lease Call Louis Felder (914) 238-9631 Computer Merchants Inc.

4361-ML5

For Sale Or Lease

Available...Sept. 1st SYSCOMP

Jim York (813) 799-4310

FOR SALE OR LEASE (1) 3370-A11 (1) 3370-B11 (20) 5251-11 w/Cab Available August 25th
Guaranteed For
IBM Maintenance Qualifications
CREDENTIAL LEASING CORP.
(717) 255-7871 Keith Solsky

3747 TAPE/DISKETTE
DATA CONVERTOR
W/1480, 1660, 3888, 7690, 7885
Call Marti Blaustein
(914) 238-9631
Computer Merchants Inc.

IBM

5219-D02

w/7860 Sheet Feed Available Today Midland Financial 800-328-9599 (612) 559-7171

SYSTEM 34 **UPGRADES**

Memory • Disk • Magazine
• Communications

PRINT TRAINS

IBM 1416 & 3216 Bought - Sold - Lease Repaired - Reconditioned COMPU-ACT COMPANY, INC.

Wanted to Buy (End User)

IBM 4341 P2 or P12

Don Holsinger Va. Farm Bureau Richmond, Va 23261 (804) 788-1234

IBM 4341-L10

4MB, 3 Channel IBM Warranty To 11/29/84 Lease For 36 Months At \$2,000/Month and Then You Own It (212) 736-4433 x283

HEWLETT **PACKARD**

HP DISC DRIVES 7925S 120Mb \$7,950 7933H 404Mb \$22,900 SAVE THOUSANDS

HP 3000 SERIES 64 Most any configuration upgradeable to Series 68

SAVE AT LEAST \$50,000 items in stock - Immediate de-ery. All warranted to qualify for HP Maintenance

ConAm Corporation
1337 Santa Monica Mail, Ste 209
Santa Monica, CA 90401
800/643-4954 CA-213/458-2643
Telex: 215 604 PCS UR

HP 3000

BUY • SELL • RENT • LEASE
Complete Systems
rocessors • Peripherals • Parts
ConAm Corporation
Santa Monica, California Santa Monica, California (213) 458-2643 (800) 643-4954 Telex: 215 604 PCS UR

HP3000 3X. III, 4X

and related peripherals
Call Carol
CSU INDUSTRIES, Inc. 516-239-4310

2 HP3000 SERIES 44

2 MB Processors 2621A, 2629A, 2382A Terminals 7933 & 7925 Disk Drives 7970E Tape Drives 2619A & 2608A Printers Contact Don Bilodeau Equitable Life Leasing (415) 891-9300

HEWLETT PACKARD

HP-250 SYSTEMS - PERIPHERALS - MEMORY

2622D Emulation Software 4 HP-150/9816/125/IBM-PC

XMITAL DATA COMM (408) 747-1239

2 NP2000 SERIES 44 FOR LEASE 2 MB Processors: 2621A, 2620A, 2620A Terminals: 7933 8 7935 Disk Drives: 7970E Tape Drives: 2619A & 2600A Printers Two units including software can be used for \$12,737 db per month for 42 months with fair market value at end of sease. Will configure to your needs. Contact Dom Blockeup Equitable Life Leasing (415) 991-9300

PRIME

LARGE SELECTION OF USED PRIME COMPUTER SYSTEMS ...SAVINGS TO 50% Peripherate also available 1st SOLUTIONS, INC. 2001 EAST CAMPBELL AVE. PHOENIX, ARIZONA 85016 (602) 957-0999 ASK FOR DON OR MATT

BURROUGHS

BUY SELL LEASE BURROUGHS

Equipment Dealers Since 1977

Over \$4,000,000 In Stock

Computer Provisions (216) 248-7878 (Member IBDA)

DEC

DEC & EMULEX SPECIALISTS

			New \$8,750
,	VAX 11/780	DZ11	RM80
	VAX 11/750	MJ11-BE	RP07-AA
	VAX 11/730	LA 38	RP07-AB
	POP 11/23	LA 50-RA	MS11-LD
	PDP 11/34	MS780-E	TU77-AF
	PDP 11/44	MS730-CA	TU78-AB
	PDP 11/70	MS750-CA	VT101-AA
	CDC 9766	RL01-A	VT100
	CDC 9775	RL02-AK	VT220
	DH11-AD	RM03-AA	SC750
	DMR11	RM05-AA	SC21-F
	DMC11-DA	PMOS-AC	CS11-H

DEC cables/Prime computers availa

SEVCO INC. (617) 435-6938 (617) 435-5331

New CDC Disk Drives, Fully Warranteed For Ninety Day Includes Installation, Safety Shielded Flat Ribbon Cables Stand, And Terminator Card. Call Toll Free: 1-800-FOR-ERST In New York: (212) 431-1100 ERST International Corporation 225 Lafayette Street New York, NY 10012

DEC NEW & USED BUY - SELL - EXCHANGE Systems • Processors • Memory Options • Peripherals • Modules LAKEWOOD COMPUTER CORP.

P.O. Box 23279 San Jose, CA 95153 (408) 266-2545

DEC

VAX 780

2 Mb, 2 RM05s, DZ113, TE16, P11, LA120, Expen. Cab., VMS Immediate Availability ort Or Long Term Leas Brookvale Associates 800 645-1167 New York (516) 273-7777

PDP11/40 KE44-A RK11D
PDP11/45 KK11-A RKV11D
DB11-A LA36-CE RL01-A
DD11 LP11-WA RM05-C
DL11 MK11-BE RP06-C
DZ11-C RH11 TMB11-EA
B61 RH780 PTW77-FB
RP04 & RP96 parts Power Supplie

PACIFIC COMPUTER SALES DEC SYSTEMS SALE

PDP 11/73
1/2" Microstreaming Tape
80 Megabyte Winchester Drive
4 Port Multiplexor
42" Metal Cabinet on Casters
*** \$20,900 ***

For Sale By Owner

1134A 10" CPU, (2) RK07, DL11WA, DZ11A, DL11A, (3) VT100, LASB, LP05VA. Above Eligible For DEC Maintenance. Also, 1134A 10" CPU, DZ11, RK05J, RX01, Total Package \$16,750. Call (402) 734-3800.

NEW

While They Last \$1195.

Public Office Corp.

(202) 030-3999		
/T220 (New)	\$1,22	
/T100 (Used)	\$82	
A100-BA	\$1,20	
ECMate I	\$2,19	
RX02 Drive	\$1,55	
RA81	\$15,90	
1/73	Ca	
1/730	\$27,00	
Digital Comput	ter Resale	
Call (713) 44	15-0082	

BUY	• SELL •	TRADE
1124-DC	H7112-A	RP04/6-C
11/750	KMC11-B	RP06-AA
BA11-KE	LA120-DA	RX211-BK
BA11-KU	RA60	VT1XX-AC
DZ11-A	RH780	VT100-AA
DZ11-DP	RM03-C	VT220-C
		EXCHANGE
(516)752	-8666 (80	0)645-9109

DATA GENERAL

For Sale by user,

(1) 4206	MCA 1,500	
(1) E9902-E	MV4000 with:	
4367	negotiable IAC-8	
	600 bpi streaming	
E6161-A	147 mb disc drive	
	ay cabinets, D400	
troller. Bare	b mem., Data con-	

6/83. (3) E6236 NEW 354 mb disc sub-22,500 (2) B6061-A 192 mb disc add-10,500 (1) B6061 190 mb disc subsys-11,700

1 700
11 B4244 900 LPM subsys11 B4422-T LP2 180 CPS sub12 System
10 G10/sp with 256 kb
mem., 15 mb disc drive, diskette drive, power supply, ulm15 mb disc drive, diskette drive, power supply, ulm16 mb disc drive, dis-

ntact: W C Strange (213) 972-7222 Desktop Generation

10, 20, 30 Immediate Delivery Systems, Software, Service pley Manageme (617) 769-9430

DATA GENERAL

D-210.....\$915 D-410.....\$1435 D-211......\$945 D-460.....\$1595 esktops: Call for our special of ices include Spreadsheet Progr Any & All DG Cables in Stock Vill Not Be Undersold On the or Used DG Equipment too Date Systems, Inc. (212) 687-2380

WANG

ERST is The Leading Dealer In WANG Equipment: 2200 • VS • WP • PC CPUS, Terminals, IOPs, Controllers, Printers, Memory Upgrades. Plug Compatibles. Rental And Leasing Price Quoted On Request.

Call Toll Free: 1-800-FOR ERST In New York: (212) 431-1100 ERST International Corporation 225 Lafayette Street New York, NY 10012

WANG LISERS HAVE YOU HEARD ABOUT THE GROUP OF FORMER WANG EM-PLOYEES IN ATLANTA WHO BUY & SELL USED WANG EQUIPMENT AND PLUG COMPATIBLES? I.C.A. (404) 977-4388 or 1-800-241-3159

600 LPM Lazer Printer

Only \$3,495
For Wang VS, PC, 2200, OIS & IBM PC
YIPKON BUSBIESS SYSTEMS
311 Route 46, Fairfield, NJ 07006
(201) \$75-6722 Telex # 380609 Yipkon FFLD Authorized IBM, HP, Wang System House

MISC.

Buy • Sell • Lease Short Term Rental DATAPOINT **AVAIL IMMEDIATELY** Cougar Computer Corp. (216) 261-3500

MISC. SYSTEMS

DATAPOINT

Sell Buy Lease (1) 8200 Terminal (1) 9487 16-Port Hub

General Data Processing, Inc. 3300 Main Street Suite 204 Houston, TX 77002 (713) 523-6454

FOR SALE/LEASE USED NIXDORF

Terminals, and Comm.
METRO SYSTEMS, INC.
P.O. Box 4697 Tulsa, Ok 74104
Bob Millsap, 918-743-5351

SOFTWARE FOR SALE

LOW COST SOFTWARE

For IBM Systems 34/36

*Accounts Receivable/Billing * Payroli*
*Inventory Control * Accounts Payable*
*General Ledger *

Preliminary Documentation Available One Time Purchase -No Additional Expense

No Additional Expense
\$250 Each
Or All Five Systems For \$1,000
Contact
L. N. Morris & Assoc., Inc.
608 Riverside Drive (919) 228-0023
Burlington, NC 27215 (703) 228-8517 We Transform "Computere into "Computer Ease"

SELL YOUR SOFTWARE

in the Classified Pages Of Computerworld

For more information call: 800-343-6474 or 617-879-0700





General Accounting	Payroll/Personnel
Financial Reporting	Property & Equipment
Accounts Receivable	Report Writer
Accounts Payable	Oil & Gas
Order Processing	All Systems are:
Inventory Management	RPG IL/RPG III
Sales Analysis	Data Base
lob Cost	Injuracina

J.D. Edwards & Comp

TRM ...

_	Payroli/Personnel
	Property & Equipment
7	Report Writer
_	Oil & Gas
_	All Systems are:
ī	RPG IVRPG III
ī	Data Base
-	

Dallas — 214/ 458 0636 Houston — 713/ 880 8278 San Francisco Bey Area — 415/ 5 Newport Beach — 714/ 751 5302 Balersfield, CA — 805/ 327 1911 Tulsa — 918/ 493 1477 415/ 571 5755

IBM SERIES/4 (\$FSEDIT Users Only)

Do yourself a BIG favor, switch to EXEDIT. 10 times faster & more powerful, EXEDIT saves time & money; eliminates \$FSEDIT frustration.

For 3404B & 4978/9 term

Call or write for free demo diskette.

H & A Computer Systems 30 Hotaling Place #204 San Francisco, CA 94111 (415)434-3517

SEDIES/4 SPECIALISTS



APPLICATION SOFTWARE

- Purchasing Management
 Shop Floor Control
- Job Costing & CRP
- Order Processing &
- Sales Analysis Accounts Receivable
- · General Ledger
- -Budgeting, Allocations Accounts Payable

DEC REPAIR

Our Repair Prices are

up to 25% less than

DFCmailer

DC

We repair all DEC equipment from LSI to VAX.

10 day turnaround with expedite service available

plus a 90 day warranty. At TDC, service is our only product.

Written in VAX-11 BASIC utilizing standard RMS-11 files compatible with DATATRIEVE and other DEC layered products

(617) 933-3780



WHITE HAT White Hat Systems, Inc., ntvale Avenue, Woburn, MA 01801

TIME & SERVICES

The State of Oregon, Adult and Family Services, is establishing a list of qualified consultants interested in receiving a Request for Proposal for services. Consultants envices will be for assistance in the preparation of a Request for Proposal for a distributed computer system, both hardware and software, assistance with the evaluation of responses to the RFP and testing of the proposed hardware/software solution. Qualified consultants please send company name, address and overview of experience to: experience to:

Carl McIntyre
Director of Data Processing
409 Public Service Building
Salem, OR 97310

Tell us about the

Time & Services

you have to offer...

...here in

COMPUTER WORLD's

Classified

pages.

COMPUTER TIME RENTAL

IBM 4341 OS/VS, VM/ CMS, CICS 1.6, IDMS and VSAM. Arrangements made for long or short term rental - on-site or off-site at the most resonable rates in the metropolitan area. Pi call (212) 777-8457.

MVS-XA TEST TIME

IBM 3083-J MVS SP 1.3

anacomp

COMPUTER RESOURCE

813-366-2600

2 MAN - GO ANYWHERE - SYSTEM 38 PROGRAMMING TEAM. **AVAILABLE FOR** SHORT/MEDIUM DURATION CONTRACTS.

BACKGROUND: S/3, S/34, S/36, S/38, S/370, S/4341

PHONE: 804-254-0594 (USA - 24 HOUR SERVICE)

VAX 11/780 AND PDP-11 DEVELOPMENT TIME

Ommicomputer:

BUDGET 212-944-9230

ICOTECH

Innovative Computer Techniques

COMPUTER SERVICES IBM 3081 DEC-10

COMPUTER OUTPUT MICROFILM

Route 202 Raritan, NJ 08869 201-524-0153 ntact: Joyce Bogae

CONSULTING SOLUTIONS, INC.

Software assistance for all SPERRY OS/3 users.

Contact-Steven S.Gold 212 275-8976

VAX TIME

O CPU CHARGES ON PLANS B & C. ROGRAMMING SERVICES AVAILABLE AVAILABLE NATIONWIDE VIA TELENET

MIDEOM

(714) 99VAX11 (714) 998-6041



4341-2

COMMERCIAL DATA

PROCESSING

OS-DOS-VM/CMS CICS-ROSCOE
REMOTE JOB ENTRY
CICS DEVELOPMENT
CUSTOMIZED SOFTWARE
XEROX LASER PRINTING

Contact Greg Gorab (201) 777-3454 15 MINUTES FROM LINCOLN TUNNE DAY PASSAIC STREET WOOD RIDGE, N.J. 07075

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

ctions: Please be sure to specify the section you want: Time and Services, Software for le, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Want-, Business Opportunities and Real Estate).

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Fig-ure about 25 words to a column inch, not including headlines.

Cost: Our rates are \$128.10 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs \$256.20 per insertion. Extra space is available in half-inch incements and costs \$64.05. Box numbers are \$15.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired: ___columns wide by__ Issue Date(s):

Send this form to:

COMPUTERWORLD **CLASSIFIED ADVERTISING,**

375 Cochituate Road, Box 880, Framingham, MA 01701

Foreign Editorial/ Sales Offices

England: Martin Durham, CW Communica-tions Ltd., 99 Grays Inn Rd., London WCI 8UT. Phone: 01-831-9252, Telex: 262346. Euan Rose, Bill Dunlop, Stephen Thomas, Beere Hobson Assoc., 345 Goswell Rd., Isling-ton, London EC.IV FHN. Phone: 01278 3415/6 (reps for all CWCl publications except Computer Management and Computer Business Europe).

W. Germany: Eckhard Utpadel, CW Publika-tionens, Friedrichstrasse 31, 8000 Munich 40. Phone: (089) 38172-0. Telex: 5215350. France: Axel Leblois, Le Monde Informatique,

185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, Paris. Phone: 758.14.14. Telex: 613234 F.

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882, Telex: 252-4217 (Computerworld Japan only).

H. Kajiyama, Tokyo Representative Group, Sanshin Kogyo Bldg, 3F, 2-10 Kanda Jimbo-cho, Chiyoda-ku, Tokyo 101, Phone: (03) 230-4117/ 8, Telex: J26860 (reps for all CWCI publications except Computerworld Japan).

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: AA74752

Brazil: Eric Hippeau, Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Akindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130838(WORD BR).

Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-4218, (905) 514-6309. Telex: 1771300 ACHAME, 1777809 ACHAME.

Spain: Neil Kelley, Computerworld/Espana, Barquillo 21, Madrid 4. Phone: 231-23-85; 231-23-86; 231-23-88. Telex: 47894(CW E).

Denmark: Preben Engell, Computerworld/ Denmark, Gammel Strand 50, 1202 Copenha-gen K. Phone: 01-1234-11. Telex: 27566 cwdan.

Sweden: Bengt Mamfeldt, Nova Media, Nova Media AB, Vartavagen 55, 11538 Stockholm. Phone: 08-234280. Telex: 8105099 NOVACW.

The Netherlands: Johannes A. Witvoet, Mgr. Dir., Computerworld Benelux, Van Eeghenstraat 84, 1071 GK Amsterdam. Phone: 020-646426. Telex: (844) 18242.

Italy: Daniele Comboni, Gruppo Editoriale Jackson, s.r.1, Via Rosellini 12, 20124 Milano.

Argentina: Ruben Argento, Gen. Mgr., Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

Norway: Mr. Per Berrefjord, Editor, CW Norge A/S, Hovinveien 43, P.O. Box 2862, Toeyen, Oslo 6. Phone: 2/647725. Telex: (856) 76476

Southeast Asia: Mr. David Naidu, G Manager, Asia Computerworld, Pte. Ltd., 11-08/ 11-10 Goldhill Plaza, Newton Road, Singapore. Phone: 250-4444. Telex: (786) RS 37003

ian Mclean, Asia Computerworld Pte. Ltd., 2023 Swire House, 9 Connaught Rd. Central, Hong Kong. Phone: 210395. Telex: (780) 72827 HX COMWR.

Saudi Arabia: Mr. Omar Dusuki, General Manager, Saudi Computerworld, P.O. Box 5455, Jeddah. Phone: 6519690. Telex: (928) 401205.

ADVERTISERS INDEX

ACX 108
AFIPS
Aluminum Case Co
American InternationalID/22
American SoftwareID/24
Ampex
Apollo Computer
A.S.T. Research
AT&T Information Systems
AT&T information Systems 48-49,94-95
Barr
Boeing ComputerID/31
Boscom119
Braegen CorpID/7
BurroughsID/8
Cambridge SystemsID/30
Candie
Chicago SoftID/12
CIES/DSD
CMI Corp38
Codercard
Codex 21
Compaq
ComputerFaire
Computer Power Systems8
Computer rower Systems
Corodale24
CRWTH Computer CoursewaresID/10
Cullinet
CW Extra109
CW SwedenID/19
D & B Computing Services59
Data Access28
Data Design Associates74
DataproductsID/10
Dataproducts ID/10 Datastream Communications 104-105
Datatrend64
DEC/TPG 62-63
Deltak, Inc
Develcon
Digital Communications Associates 122-123
Digital Datacom
Digital Datacom12
Eastman Kodak, Co115
EDP Security4
ELXSI97
Epson America78
Equitable Life LeasingID/9
-
Four Phase Systems 56-57
•

Fox Research	. 64
Fusion	.91
General Electric120-	
Goal Systems 51,	101
Gould Inc98	-99
Hayes Microcomputer90	.91
Hetra Computers And Communications Inc	lus-
try	116
Hewlett-PackardID/28-ID/28	.83
Honeywell Information Systems	27
Hughes Aircraft	114
TD14	
IBMID/23,112-	113
ICCP26	5,88
ICCS54,	118
IDE Associates, Inc.	
IDP	
INFO '84	
Infotron	124
Innovative ElectronicsID	/11
Innovative Software	19
Intech	
Integrated Technology	79
IntelID	/27
Interface Systems	102
International Arvazi	. 54
FTT	
I Cld	0 10
Lear SieglerID/2-II LeeMah	D/3
Local Data	5
3M · Data RecordingID/20-ID	/21
Mathematica	86
Maxell-Computers	126
MBAID	/19
Memorex 4	
Michaels, Ross & Cole	90
Micom Systems	37
MicroFrame	6 36
MIS Training Institute	22
MSA	150
MSP	
MTI8	
	.,
National Information Systems	42
NCR Comten, IncID	/32
NEC	100
New Generation Software	42

Okidata Corp. 7 On-Line Software ID/1 Ken Orr & Associates, Inc. 9 Oxford Software 11	4
Pathway Design	5 7 9 3 9 5
Racal Vedic	
SAS Institute	3 8 5 0 1 16 18 3
Techland	14 16 13 15 13 17 18 18
UCCEL 684 Ungermann-Bass ID Universal Data Systems 16 USL Data Systems 1	6
Virtual Microsystems	16
Winterhalter AssociatesID/2	26
Xyplex, IncID/1	12
Yourdon	32

Computerworld Sales Offices

BOSTOM SALES OFFICE (617) 879-0700 Northern Regional Managar/Ronald Mastro District Managary/Inn McChae, Michoel F. Kelleher David Peterson, Bill Godigan Sales Assistant/Alics Longley COMPUTERNYCHELD, 373 Coothuate Road, Box 880, Ferningian, Mc 01701

CHICAGO SALES OFFICE (312) 827-4433
District Managers/Arthur Kossack, Russ Gerches
Sales Assistant/ Jean F. Broderick
COMPUTERWORLD, 2600 South River Road, Suite 304,
Des Plaines, IL 60018

NEW YORK SALES OFFICE (201) 967-1350
Eastern Regional Director/Michael J. Masters
Senior District Manager/Doug Cherey
District Manager/Ray Corbin, Joan Daly, Fred Lo Sapio
Sales Assistant/Gale M. Paterno
COMPUTER/WORLD, Paramus Plaza I,
140 Route 17 North, Paramus, NJ 07652

LOS ANGELES SALES OFFICE (714) 261-1230
Senior District Manager/Bob Hubbard
District Manager/Bernie Nockswender
Western Regional Director/William J. Healey
COMPUTERWORLD, 18008 Sky Perk Circle, Suite 260, Invine, CA 92714

SAN-FRANCISCO SALES OFFICE (415) 421-7330 Western Regional Director/William J. Healey Sendro District Manager/Barry Milliam D. Hoteley Sendro District Manager/Emp (Homebretian, Mark V. Glas Account Manager/Emp (Charmbertian, Mark V. Glas Account Manager/Debora Cramer CoMPUTE/MIRCALD, 300 Graedway, Suite 20, San Francisco, CA 94133

ATLANTA SALES OFFICE (404) 394-0758
District Manager/Jeffrey Meinick
Eastern Regional Director/Michael J. Mesters
COMPUTERWORLD, 1853 Peeler Road, Suite D,
Atlanta, GA 30338

HOUSTON SALES OFFICE (713) 952-1220 District Manager/William Mahoney Western Regional Director/William J. Healey COMPUTERWORLD, 8401 Westhelmer, Suite 110, Houston, TX 77063

CLASSIFIED ADVERTISING (617) 879-0700 AI DeMille COMPUTERWORLD, 375 Cochituate Road, Box 880, Framingham, MA 01701

Computer National Maineting Services
General Manager/Diana La Muraglia
COMPUTERWORLD, 375 Cochinuate Road, Box 880,
Framingham, Mo 1701
(617) 879-0700
Manager, West Coast/Isabella Barbagallo
COMPUTERWORLD, 1060 Marsh Road
Merio Park, CA 94025
(415) 328-8064

CW COMMUNICATIONS/INC.

Board Chairman Patrick J. McGovern Lee Vidmer

Publisher/Vice-President, Donald E. Fagan. Group VP-Communication Services, Jack Edmonston. Group VP-Circulation, Margaret Phelan. VP-Finance, William P. Murphy. VP-Editorial, John Whitmarsh. Computerworld Headquarters: 375 Cochituate Road, P.O. Box 880, Framingham, MA 01701 Phone: (617) 879-0700, Telex: 95-1163.

National Director, Edward P. Marecki. Corporate Advertising Administrator, Frank Collins. Manager/Marketing & Sales Operations, Kathy Doyle. Display Advertising Supervisor, Anne Hadley. Display Advertising, Deborah Bryer, Pam Valentinas, Carolyh Medeiros, Cindy Cheksa, Mary Waddick. Classified Operations Manager, Cynthia Delany.

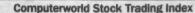
COMMUNICATION SERVICES Group Vice-President, Jack Edmonston. Director Research, Kathryn Dinneen. Sales Promotion Director, Liz Johnson.

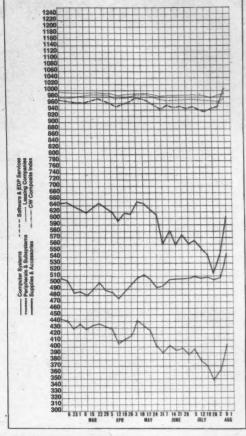
Production Director, Peter Holm. Production Manager, Marlene Stibal. Paste-Up Manager, Trish Gaudette. Systems Manager, Tom Pfau. Typesetting Manager, Carol Polack. Art Director, Tom Monahan. Graphic Designer, Hank Filing.

Group Vice-President, Margaret Phelan. Circulation Manager, Jane Desberg, Fuffillment Manager, Maureen Burke.

Fuffillment Manager, Maureen Burke.

To Sam microtion trough threatly Microtin Int., Perdoical Enty Dept., 300 Zeeb Rd., Ann Arbor, Mich. Octopularionist in Research with 20 Computationist in Research with 20 Computationist in Research Will Solve State Rd., Ann Arbor, Mich. Computerworld can be purchased on 48106. Phone: (313) 761-4700. Con





Computerworld Stock Trading Summary

computed and formatted TRADE QUOTES, INC

	1983-84 RANGE (1)	CLOSE :	MET CHHÉE	MEEK PCT CHNGE
СОМ	PUTER SYS	TEMS		
ALPHA MICROSYSTEMS	8- 24	11	+1 3/4	+18.5
ALTOS COMPUTER SYST	8- 21	11 1/4	+2 3/8	+26.7
APPLE COMPUTER INC	10- 30	12 3/4	+2 1/4	+21.4
ATAT	19- 63	28 1/Z 18 3/4	+3 1/2	+14.0
BURROUGHS CORP	44- 58	56 5/8	+2 3/4	45.1
COMPUTER AUTOMATION	5- 17	5	0	0.0
COMPUTER CONSOLES	14- 28	18 5/8	+3 5/8	+24.1
CONTROL DATA CORP	25- 62	30	+3.1/4	*12.1
CONVERGENT TECHNOL CRAY RESEARCH INC	10- 41 39- 38	14 1/8	+ 7/8 +5 1/2	+8.6
DATA GENERAL CORP	27- 52	53 1/8 52 3/8	45 7/8	412.6
DATAPOINT CORP	16- 31	21 1/2	+2 1/8	+10.8
DIGITAL EQUIPMENT	64-125	85 7/8 13 3/8	+2 1/2	+2.8
ELECTRONIC ASSOC.	3- 15	3 7/8	+ 7/8	0.0
FLOATING POINT SYST	13- 44	17 3/4	+1 3/8	+29.1
	26- 42		43 1/8	+11.3
GENERAL AUTOMATION	7- 18	9 5/6	os 3/8	+16.6
DOULD INC	24- 44	30	+4 1/8	+15.5
HARRIS CORP	23- 49	30	+3 5/8	+13.7
MEHLETT-PACKARD CD	31- 4B	41 1/4 81 3/8	+3 3/8	48.8
HONEYHELL INC	46- 69	118 5/8	+6 1/8	+11.0
IPL SYSTEMS INC	3- 14	2	n 3/6	-11.1
M/A-COM INC	13- 35	20 1/8 26 5/8	+1 3/8	
MANAGEMENT ASSIST	9- 27	26 5/8	+2 1/4	+8.2
MATSUSHITA ELEC(ADR)	80- 86	87 3/4	+5	+7.8 +12.5
HOMANK DATA SCI	8- 17	13 1/8	+1 - 2/8	+12.5
	29~ 49	39 5/8	+3 3/8	+9.3
HAT'L SEMICONDUCTOR	11- 20	14 5/8	+2 1/8	+17.0
NBI INC	17- 38		+ 3/8	+2.0
PERKIN-FLMER	21- 34	28 23 3/8	+1 7/8	47.7 +20.6
PRINE COMPUTER INC	11- 26	18 3/4	41 1/4	+8.0
SPERRY CORP	11- 26 35- 50	18 3/4 38 1/2	+ 5/8	+1.0
TANDEM COMPUTERS INC	15- 40	16 1/8	+1 1/8	+7.5
TAND CORP TELEVIDED SYSTEMS	25- 62 4- 41		+2 1/2	+40.0
TELXON CORP	8- 16	11 7/8	+1 3/8	+13.0
TEXAS INSTRUMENTS	101-169	136 1/4	413 3/8	+10.B
	15- 24	20 5/8	+ 5/8	+3.1
VECTOR GRAPHICS INC	24- 42	28 5/8	0	0.0
HANG LABS "E"	24- 42	28 1/2	+2 3/8	+7.5
XEROX CORP	35- 52	37 1/8	+1 3/4	+4.8
LEAR	ING COMPA	HTES		
BOOTHE FINANCIAL CP	10- 21	21 1/4	+1 1/4	+6.2
CONDISCO INC		12 7/0	+1 1/4	+10.7
CONTINENTAL INFO SYS	5- 16	6 1/2	+1 5/8	+33.3
DPF INC'	10- 15	11 3/4	+ 1/8	91.0
PHOENIX AMERICAN INC	6- 17	6 1/4	4 3/4	+13.6
SELECTERN INC	28- 44	12 34 3/4	+4 3/4	*15.E
			374	
	COMPONENT			
ADVANCED WICRO DEV	25- 37 16- 38	34 5/8	+4	+13.0
ANALOG DEVICES INC	20- 32	23 1/2	+3 1/4	+16.0
AMALOGIC CORP	10- 31	11 1/4	+ 1/2	. +4.8
APPLIED MAGNETICS CP	9- 37	10 5/8	41	+10.3
TERADYNE	23- 39	31 3/4	+4 5/8	+17.0

8	KCH:	N-NEH	YORK?	A=1	MERIC	TIME	PEPA	CIFIC:	8=80	STO	
		L. NAT	CHAL	Hel	4I DHES	TI C	SAD=	R-THE-	COUNT	TER	
0	-T-C	PRICES	ARE	GID	PRICE	S A8	OF	3 P.N.	OR I	AST	BID

E × C		1983-84 RANGE	CLOSE	HEER	MEER
H		(1)	1984	CHNGE	CHNGE
	SOFTHAN	RE'& EDP 5	ERVICES .		
0	ADVANCED COMP TECH	3- 8	3 3/4	• 1/2	+15.3
N O	ADVANCED SYSTEMS INC	14- 22	17 13 3/4	+ 1/2	+1.0
0	AMERICAM SOFTHARE	13- 31	14 1/2	+1 3/4	+13.7
N.	AMACOMP INC	2- 19	2 1/8	0	0.0
0	AMALYSTS INTL CORP	5- 17	\$ 3/4	0 1/2	49.3
A	APPLIED DATA RES.	18- 37	23 3/8	+4	+20.8
0	ASK COMPUTER SYSTEMS	13- 21	19 1/2	+1 7/0	+10.6
8	ASTRADYNE COMP IND AUTOMATIC DATA PROC	30- 44	37 3/8	0	0.0
0	COA COMPUTER ASSOC	8- 17	12 1/0	+2 1/8	+6.0
ä	COMPUTER ASSOC INT'L	15- 35	23 1/4	+5 1/2	+30.8
0	COMPUTER HORIZONS	8- 20	7	+1 1/2	·27.2
0	COMPUTER NETHORK	5- 11	5 1/4	0	0.0
N	COMPUTER SCIENCES	11- 23	14 1/8	+1 3/4	+14.1
0	COMPUTER TASK GROUP COMPUTER USAGE	6- 19	14 1/2	* 1/4 * 3/8	+1.7
ă	COMPUTONE SYSTEMS .	4- 23	4 7/8	0 1/4	+5.4
o	COMBERV CORP .	1- 16	2 3/4	- 1/4	-9.3
0	COMSHARE	7- 14	8	+1 +	+14.2
	CULLINET SOFTHARE	24- 50	44 3/4	+7 1/2	·20.1
0	CYCARE SYSTEMS INC	18- 25	20	+7 1/2	*20.1
N	ELECTRONIC DATA SYST	25- 44	43-1/2	- 3/8	-0.8
0	HOGAN SYSTEM INC	10- 27	12 1/2	41 1/4	+11.1
N	GENERAL ELECTRIC CO	45- 59	56 3/4	+3 3/8	+6.3
N N	GTE CORP	38- 48	39 3/4	+2	+5.2
	INFORMATICS INC INFORMATION SCIENCE	15- 32	\$4 1/2	-1 3/8	-8.6 +5.2
000	INFORMATION SCIENCE	24- 43	31	+4 1/2	+16.1
ö	KEAME ASSOCIATES	6- 15	10 1/2	41	+10.5
Ä	L001COM	18- 31	27	43 1/2	+14.8
0	MCI COMMUNICATIONS	8- 29	7 1/2	+ 5/0	+9.0
0	HNGT SCI AMER INC	11- 33	12	+ 1/2	+4.3
00	MATHEMATICAL APP GRP MICOM SYSTEMS INC	8- 18 31- 50	8 1/2	- 1/2 -5 1/4	-7.1 +14.6
0	HONCHIK-HEBER CP	8- 22	9 1/8	+ 3/8	+4.2
ö	NATIONAL DATA CORP	14- 26	16 3/6	+ 1/2	+3.5
0	ON-LINE SOFTMARE INT	8- 29	8 3/4	- 1/4	-2.7
0	PANSOPHIC SYSTEMS	11- 30	15 1/8	+1 7/8	+14.1
М	PLANNING RESEARCH	12- 21	13 -	+ 1/4	+1.8
0	POLICY MONT SYSTS CP	22- 35	27 1/2	+ 3/4	+2.6
0	PROGRAMMING & SYS	4- 8	5 1/4	+ 5/8	+13.5
00	REYNOLDS & REYMOLD BEI CORP	13- 34	16 3/8	*4 *2 3/8	+13.3
a	SHARED MEDICAL SYST	23- 43	24 1/2	-1 1/0	-4.3
ă	SCIENTIFIC COMPUTERS	6- 14	9 1/4	+ 1/4	+2.7
0	SOFTHARE AG	8-14	1.2	+1 1/2	+14.2
Ni Nr	URS CORP	10- 18	11	+ 1/2	44.7
HE.	UCCEL	7- 17	9 3/4	+1 1/2	+10.1
	PERIPH	RALS & SU	BSYSTEMS		
p	AM INTERNATIONAL	2- 7	2 7/0	+ 1/4	49.5
A	ANDERSON JACOBSON	7- 28		0	0.0
0	AUTO-TROL TECHNOLOGY	10- 28	12 5/8	+3	+31.1
00	AVANT-GARDE COMPUTNE	15- 29	8 1/4	43 1/4	+16.6
2	BEEHIVE INT'L	2- 15	3 3/8	+1 1/8	+50.0
10	BOLT BERANEK & NEW	17- 30	21 3/8	+2 5/8	414.0
0	CAMBEX CORP	1- 3	1 1/2	0.1/8	414.2
20	CENTRONICS DATA COMP	8- 28	8 3/4	+1 5/8	+20.0
A	CETEC CORP COGNITRONICS	4- 20	. 6	+1 5/8	+37.1

				. (Cambridg	e: Mass	. (
	-						_
-			,				
	×		1983-84	CLOSE	MEEK	MEEK	
	C		RANGE	AUG 8	CHNGE	PCT	
			***	1404	Craece.	Crimos	
	0	COMPUTER DEVICES INC	2- 10	7/8	* 1/8	*16.6	
	0	COMPUTER TRANSCEIVER COMPUTERVISION CORP	29- 53	1 3/4	-5 1/8	0.0	
	N	COMRAC CORP	11- 24	14 1/4	- 1/6	-0.8	
	A	DATAPRODUCTS CORP	16- 32	21 1/0	+3 3/4	*21.5	
	Á	DATARAM CORP DATA SHITCH CORP	S- 12 6- 41	5 3/8	-1 3/8 +2 1/4	-23.2 +38.1	
	0	DATUM INC	8- 17	6 5/8	• 7/8	+15.2	
	0	DECISION DATA COMPUT DOCUTEL-OLIVETTI	8- 16	3 3/8	o1 3/8	*14.1 -23.7	
	0	ELECTRONIC M & M	5- 11	7 1/8	-1 3/4 - 7/8	-23.7	
	0	ENDATA, INC	8- 16	8 1/4	0	0.0	
	0	EVANS & BUTHERLAND	13- 50	18 1/2	+1 7/8	+10.B	
	0	GANDALF TECHNOLOGIES GEN'L DATA COMM IND	9- 13	12 7/8	+2 1/4	+21.1	
	0	GREAT SOUTHWEST IND	10- 18	10 1/2	0	+28.5	
	16	HAZELTINE CORP	16- 31	26 3/4	0	0.0	
	. 0	ICOT CORP	3- 8	3 5/8	0	0.0	
	0	INFORMATION INTL INC	10- 19	10 1/4	~ 1/2	-4.6	
	0	INTEL CORP	27- 45	33 1/2	+2 - 3/8	-6.3	
	0	IPL SYSTEMS INC	7- 18	8 3/4	+1 7/8	+27.2	
	0	MEGADATA CORP	8- 15	12	+ 1/4	+2.1	
		MSI DATA CORP	10- 25	10 1/2	+ 3/8	+3.7	
	80	NASHUA CORP NETHORK SYSTEMS CORP	16- 28	28 3/8	+3 3/8	*16.4 *14.5	
	H	NO AMERICAN PHILIPS	30- 40	35 1/8	+1 3/8	04.0	
	. 00	NORTHERN TELECOM LTD	30- 49	28 1/8	· 3/8	00.8	
	0	PARADYNE CORP	12- 26	14 3/4	+1 1/4	0.0	
		PENRIL CORP	9- 14	13 1/2	41	+0.0	
	0	PHOENIX AMERICAN INC	6- 17	6 1/4	0 3/4	+13.6	
	86	PRINTRONIX INC	25- 41 16- 34	28	+3 3/8	+13.1	
	0	RANTEK CORP	6- 23	6 1/2	+ 1/4	+3.8 +4.0	
	96	RECOGNITION EGUIP	10- 17	11 1/2	0 7/8	*8.2	
	86	ROLH CORP	30- 80	46 3/4	+4 7/8	+11.6	
	86	SANDERS ASSOCIATES	38-120	3/8	+3 3/4	0.0	
	0	SCAN-TRON CORP	9- 19	12	+2 3/4	+29.7	
	86	SCIENTIFIC ATLANTA	0- 23	8 1/2	+1 3/B	+15.8	
	16	STORAGE TECHNOLOGY	7- 23	\$ 5/8	+1 3/8	-16.6	
	0	SYNES DATATRONICS SYSTEMS & COMP TECH	2- 13	2 7/8	*3 3/8	+15.0	
		T BAR INC	7- 17	8 7/8	+ 1/8	*11.4	
	A	TAB PRODUCTS CO	13- 20	16	+1 1/2	+10.3	
	0	TAMBON CORP	7- 35 6- 12	11 1/8	+3	+36.9	
		TEC INC TEXTRONIX INC	6- 12 32- 87	10 3/4	- 1/4 +4 1/2	-2.2 +7.8	
	30.	TELEX	19- 32	31 3/4	42	-6.7	
	0	TESDATA SYSTEMS CP	3- 17	2 3/4	+ 1/8	44.7	
90	8	TIMEPLEX INC VISUAL TECHNOLOGY	9- 28	18 1/8	+2 7/8 +1	*18.8 *11.7	
		- Colores	IES & ACC	COGRALCE			
	16	MERICAN BUS PRODE	22- 33	30	+2 3/4	+10.0	
	A	PUPLEX PRODUCTS INC	22- 27	23 7/8	+ 5/8		
	- 86	EMNIE SUS. FORMS	18- 28	20 1/2	*1 3/4	+8.3	
	24 16	HOORE CORP LTD	35- 51	81 5/8 41 1/8	+2 1/8	+6.3	
	8	STANDARD REGISTER	27~ 37	37	+3 1/2		
	80	HALLACE COMP SERVICE	23- 33	29 1/4	+2 5/8	+9.8	

Only MSA software makes your mainframe work 100 times better



 Now MSA's Executive
Peachpak™ II software links nal computers to the



2. Use your PC to access
all your MSA mainframe systems, from General edger to Manufacturing



files, so you can work



4. Get HELP if you need it, with a built-in feature that guides you through the system.



5. Choose the exact ame inform need, as much as you ne



6. Use it with Peachtree Software, 1-2-3[™] from Lotus, DIF[™] VisiCalc[™]



7. Enjoy a realtime ronment, no waiting for processing.



8. Allow only authorized el access to the



9. Get database-to-data Database Sharing



10. Use over 20-predefi applications from For example n MSA



11. Use PeachLink™ to lownload information from both MSA and non-MSA



12. Download vendor histo from MSA's Accounts Payable System and use PeachCalcTM to do



13. Print checks in remov Accounts Payable data



14. Create a salary a PC using MSA's Payroll



15. Make a purchase order ithout leaving



16. Download current nces from General Ledger to graph actual vs. planned



Capture data from MSA's Fixed Assets System, use PeachCalc™ to create a lease



18. Access available funds data in MSA's Budgetary



19. Use PeachCalc^{TO}



20. Use MSA's Manufacturing System data to produce cost/margin analysis with PeachCalc.TM



21. Dial up subscriber tabases to access curre credit information for



22. Use PeachCalc™ to analyze information, set credit and update your



23. Install it in less



24. -100

Backlogs? Rush requests? Now they're a thing

of the past.
MSA's new Executive Peachpak II links your company's personal computers directly to your mainframe. So executives can get to vital information without waiting for print-outs.

Best of all, this hot new technology is available from MSA right now (In fact, it's already installed

and working for companies across the country.)
MSA is the mainframe-to-micro leader. While other companies are still trying to work the bugs out of their initial offerings, MSA already has its second successful mainframe-to-micro product: Executive Peachpak II.

It offers such advanced features as Database Sharing, MSA's database-to-database transfer technology that lets you get all the mainframe information you need instantly.

And a Universal Interface with most micro software packages including Peachtree Soft-ware, 1-2-3™ from Lotus, and VisiCalc.™ Executive Peachpak II also includes PeachCalc,™ an electronic spreadsheet. A Business Graphics System for color charts and other graphics. Telecommunications that let personal computers talk to each other—or link to resources such as Dow Jones News/Retrieval® PeachText,™ complete report production system that lets executives edit and footnote reports. A List Manager for organization. And PeachLink, the software that links your

PCs to the mainframe.



ages: Administrative Peachpak, which includes comprehensive word processing functions. And

Graphics Peachpak, for color graphs and charts.
All include PeachLink.™ And all are backed by
the service and support MSA is so famous for.

This revolutionary new link means you can now deal with one software company that supplies all the advanced mainframe systems your company needs. All the software for your personal computers through our Peachtree Software Company. And the software that links them together.
Talk to MSA about new Executive Peachpak II.

And see how much more you could be getting from your mainframe. Call Robert Carpenter at (404) 239-2000, or write to Management Science America, Inc., 3445 Peachtree Road, N.E., Atlanta, Georgia 30326

The Software Company

MSA makes the mainframe link to personal computers a reality

